Gulf Equity Markets: A Comparison of the Structure and Performance

By

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Abstract

The present study extends the literature available on the equity markets of developing countries by describing the development, the structure and by investigating the performance of the Gulf Equity markets in Kuwait, Saudi Arabia, Bahrain and Oman.

First, an attempt was made to evaluate these equity markets by briefly examining the financial systems, providing a historical background to their development and introducing their current structure.

Second, the thesis examines the performance of these markets by; (a) conducting a survey interviews to find out the obstacles for growth and investments in these markets; (b) investigating whether share returns are independent (c) investigating whether successive share returns are random (d) examining whether there is any pattern, for instance, day-of-the -week effect on the share returns; (e) estimating their transaction costs (the effective bid-ask spread).

To analyse the performance, the study employed the classical techniques of Fama (1965), Errunza and Losoq (1985) and Dickinson and Muragu (1994) to determine the independency and randomness of share returns. The method of French (1980), Solnik and Bousquet (1990) and Insup Lee et al (1990) is used to test for the day-of-the week effect. Roll (1984) and Hsia, Fuller and Kao (1994) methods were used to estimate the transaction costs (the effective bid-ask spread).

To summarise, the results show that the Gulf Equity Markets have a dependency on their share returns for Kuwait, Saudi Arabia, Bahrain and a lesser dependency for Oman Market. On the other hand, the share returns on each of the four markets were shown to be non random. The day of the week effect was not found in the market of Kuwait, Bahrain and Oman, whereas the Saudi Market showed the day-of-the week effect in the two periods tested.

The spread as measured by the modified method of Hsia et al. is consistent with the results given by the Roll method which found the highest average spread in the Saudi Market followed by the Bahrain, Kuwait and Muscat markets.

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Abbreviations

Abbreviations

SAMA	=	Saudi Monetary Agency
GCC	=	Gulf Cooperation Council
CBK	=	Central Bank of Kuwait
BMA	=	Bahrain Monetary Agency
bn	=	Billion
SR	=	Saudi Riyal
KD	=	Kuwaiti Dinar
BD	=	Bahraini Dinar
OR	=	Omani Riyal
OBU	=	Off Shore Bank Unit
EMH	=	Efficient Market Hypothesis
RWH	=	Random Walk Hypothesis
GIC	=	Gulf Investment Corporation

Chapter II: The Development and Structure of the Gulf Equity Markets

2.1 Introduction

There are six countries that constitutes the Gulf Co-operation Council: Kuwait, Saudi Arabia, Bahrain, Oman, Qatar and the United Arab Emirates. A treaty was signed by the head of the Council States on 25 May 1981 to form the council with the underlying aim of effecting the social and economic integration of the member states.

Since 1981, some progress has been made towards the goals of the Unified Economic Treaty between the Gulf States. Two articles constitute Chapter Two of the treaty about the movement of capital and individuals and the exercise of economic activity. Article No. 8[1] of the Chapter states:

> "The Member States shall agree on executive principles to ensure that each Member State shall grant the citizens of all other Member States the same treatment as is granted to its own citizens without any discrimination of differentiation in the following fields:
>
> 1. Freedom of movement, work and residence.
> 2. Right of ownership, inheritance and bequest.
> 3. Freedom of exercising economic activity.
> 4. Freedom of movement of capital."

Also, Chapter six about the financial and monetary co-operation is set into three articles. Article No. 21[2] states:

> "Member States shall seek to unify investment rules and regulations in order to achieve a joint investment policy aimed at directing their domestic and foreign investments towards serving their interest, and realising their peoples' aspirations for development and progress"

and. Article No. 22[3] states:

> "Member States shall seek to Co-ordinate their financial, monetary and banking policies and enhance co-operation between monetary agencies and central banks, including the endeavour to establish a joint currency in order to further their desired economic goals".

These countries share a similar great dependency on the exporting of oil. Figures of 1989 show the oil as percentage of the total export: 86% in Saudi Arabia, 83.7% in Kuwait, UAE 87%, Oman 87.9%, Bahrain 41.6%, and Qatar 90%. That had affected directly the development and the evolvement of equity markets on the GCC Countries (see appendix No. 2.1).

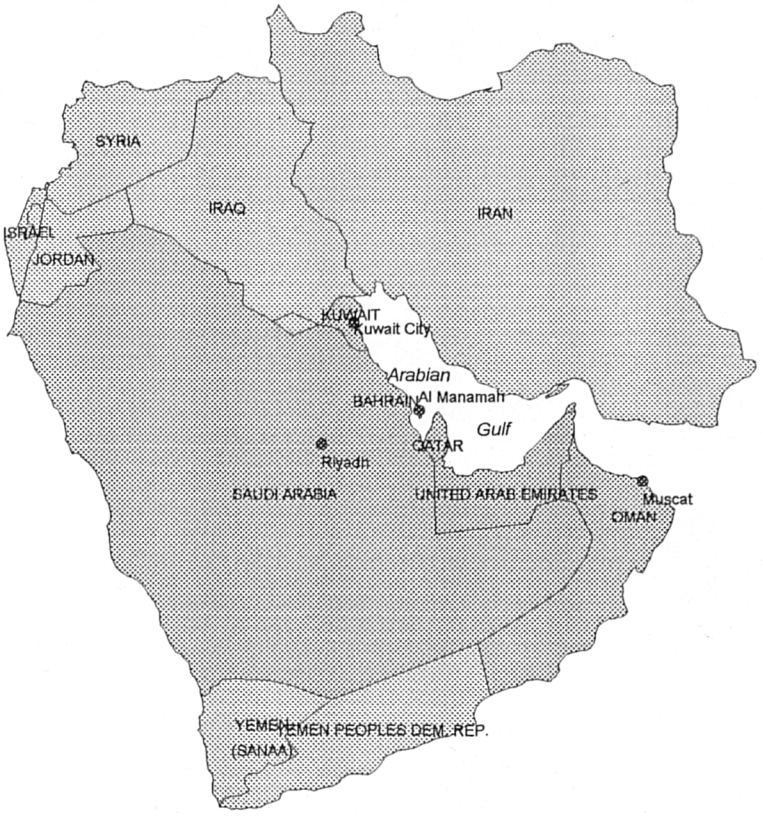
Permission for citizens of GCC Countries to own shares was granted at the GCC summit in December 1988 in Bahrain. Even though the permission of share's ownership has been granted, there are still obstacles in the way of making it a practicality.

The accounts describe economies which have undergone rapid development over the last 50 years, with sophisticated financial institutions to match this development. The evolution of regulation follows linked but separate paths, resulting in a collection of equity markets which are similar but not identical.

The focus of the study will be on four of the Gulf States Countries as in figure No. 2.1 (Kuwait, Saudi Arabia, Oman and Bahrain) and this chapter is to give a a background and a brief introduction to the financial systems of each country. Second, it gives details of their equity markets: development, regulation ,and organisation. We conclude with a

comparision of the market microstructures of the Gulf markets, with the stock market arrangements in other world centres.

Figure 2-1: The Arabian Gulf Countries



There is very little economic literature which covers the ground we must tread. Inevitably drawing on institutional sources one is drawn to the small scale detail of the regulations. In the analysis which follows we aim for a middle level description which sets out the institutional facts, but also draws themes and threads of the historical development of these markets and the barriers to harmonisation and co-operation.

2.2 Kuwait.

2.2.1 The Country Background

Kuwait lies at the head of the Arabian Gulf on the western side bordered by Saudi Arabia and Iraq. Its total area of 17,818 sq. km includes the mainland, the sizeable island of Bubiyan and other off-shore islands, and the Kuwait share of the Partitioned Zone. The Partitioned Zone was, until 1966, referred to as the Neutral Zone, and had been owned and administered jointly by Saudi Arabia and Kuwait since 1922. In 1966 administration over the partitioned halves was yielded to the sovereign states, although production of oil and gas from concession in the Zone still shared equally[4].

Until the commercial production of oil began in 1945, Kuwait was only a city-state comprising the present capital which was a significant port in terms of pearl fishing and general entrepot trading. This concentration has largely persisted to this day, with 66 per cent of the 1985 census population located within the capital or its suburbs. The only other significant urban area is south of Kuwait City in the Al-Ahmadi industrial heartland, although a large new town is scheduled to be built at the northern end of the country over the next decade.

Apart from oil and gas Kuwait virtually has no other natural resources.(see table 2.1); water is an extremely scarce commodity and desalination plants provide about 90 percent of Kuwait daily consumption. Kuwait's main oil fields are located in the south around Al-Ahmadi and in the Partitioned Zone. Several fields have been located north of Kuwait City as well, the largest of thes being the Raudhatian field.

Table No. 2.1: Kuwait Public Revenues (Million KD).

Period	Oil Revenues	Other Revenues	Total	Period	Oil Revenues	Other Revenues	Total
1981/82	2764,1	244,4	3008,5	1988/1989	2035.1	322.7	2367.8
1982/83	2334,6	267,4	2602,0	1989/1990	2935.7	298.9	3234.6
1983/84	2923,4	251,9	3175,4	1990/1991	*269.1	26.9	273.0
1984/85	2493,7	250,9	2744,7	1991/1992	*495.9	151.9	647.3
1985/86	2094,7	250,4	2345,1	1992/1993	2085.3	278.4	2863.7
1986/87	1483,9	247,0	1730,9	1993/1994	2419.8	293.9	2713.7
1987/88	1991,4	260,3	2251,7				

Source: Central Bank of Kuwait, (1993), Quarterly Statistical Bulletin October-December.
** = Effect of the Invasion of the country*

The seventh population census of Kuwait which was conducted in April 1985, showed that population of Kuwait reached 1,697,301.[5] and then a later census taken in 1990 showed the population had increased to 2,090,000[6]and it is be expected to be around 3 million by year 2000.

2.2.2 The Financial and the Banking Sector:

The main institutions today operating within the framework of the financial and banking sector in Kuwait. are the Ministry of Finance, Ministry of Commerce, and the Central Bank. The role of the public authorities is a recent development and previously the private sector was far less regulated.

When the first currency regulation was introduced in 1960, the banking sector constituted only of four banks - the National Bank of Kuwait, Gulf Bank, Bank of Kuwait and Middle East (between 1941 and 1970 known as the British Bank for the Middle East), and the Commercial Bank. After 1960, there was a rise in the number of banks and the range of their activities, and also the rise of other financial companies. The Saving and Credit Bank was established in 1961, followed by the Kuwait Investment Company in 1962 as the first investment company. Then in 1964, the Kuwait Foreign, Trading, Contracting, and Investment Company was formed.(KFTCIC).

Due to the development of the economy, by 1968 it became necessary to have an organisation to act as a government bank and supervise the monetary policy which led to establishing the Central bank of Kuwait to take place of the Council of Currency.

The constituents of the banking sector in Kuwait are: the Central Bank of Kuwait, six commercial banks, one commercial bank of joint-ownership (between Kuwait and Bahrain), three specialised banks, and one Islamic bank. The commercial banks are ; National Bank of Kuwait, Gulf Bank, Bank of Kuwait and Middle East, Commercial Bank, Al Ahli Bank, Burgan Bank and the Bank of Kuwait and Bahrain. The assets of the commercial banks are shown in Table 2.2.

Table 2.2: Kuwait Commercial Banks Assets (Million Dinars)

End of the Period	Total Assets	End of the Period	Total Assets
1985	9053,3	1990	11135.3
1986	9307,8	1991	8413.1
1987	9942,5	1992	8359.7
1988	10401,9	1993	7839.0
1989	10972.0		

Source: Kuwait Central Bank, (1989), Quarterly Statistical Bulletin (June-July)

The Islamic bank is the Kuwait Finance House, and the specialised banks are the Industrial Bank of Kuwait, the Credit and Saving, and the Real Estate Bank. The main activities of these banks which have been set up by government, are to fund industrial projects, private housing and industrial units respectively. Table 2.3 shows the assets of the specialised banks.

The financial sector in Kuwait also includes: four insurance companies, a general organisation for social insurance, and about twenty-five investment and finance companies. Such companies can take several forms under the Commercial Companies Law No. 15 of 1960. These are

general partnership, limited partnership, joint stock company, limited liability company, and the joint venture. The law is administrated by the Companies' Department at the Ministry of Commerce and Industry. Figure 2.2 provides an overview of the financial and banking framework in Kuwait.

Table 2.3: Total Assets of Specialised Banks(Million Dinars)

End of the Period	Total Assets	End of the Period	Total Assets
1985	2088.3	1990	1046.6
1986	2057.1	1991	761.6
1987	2051.8	1992	794.2
1988	2061.1	1993	695.9
1989	1013.9		

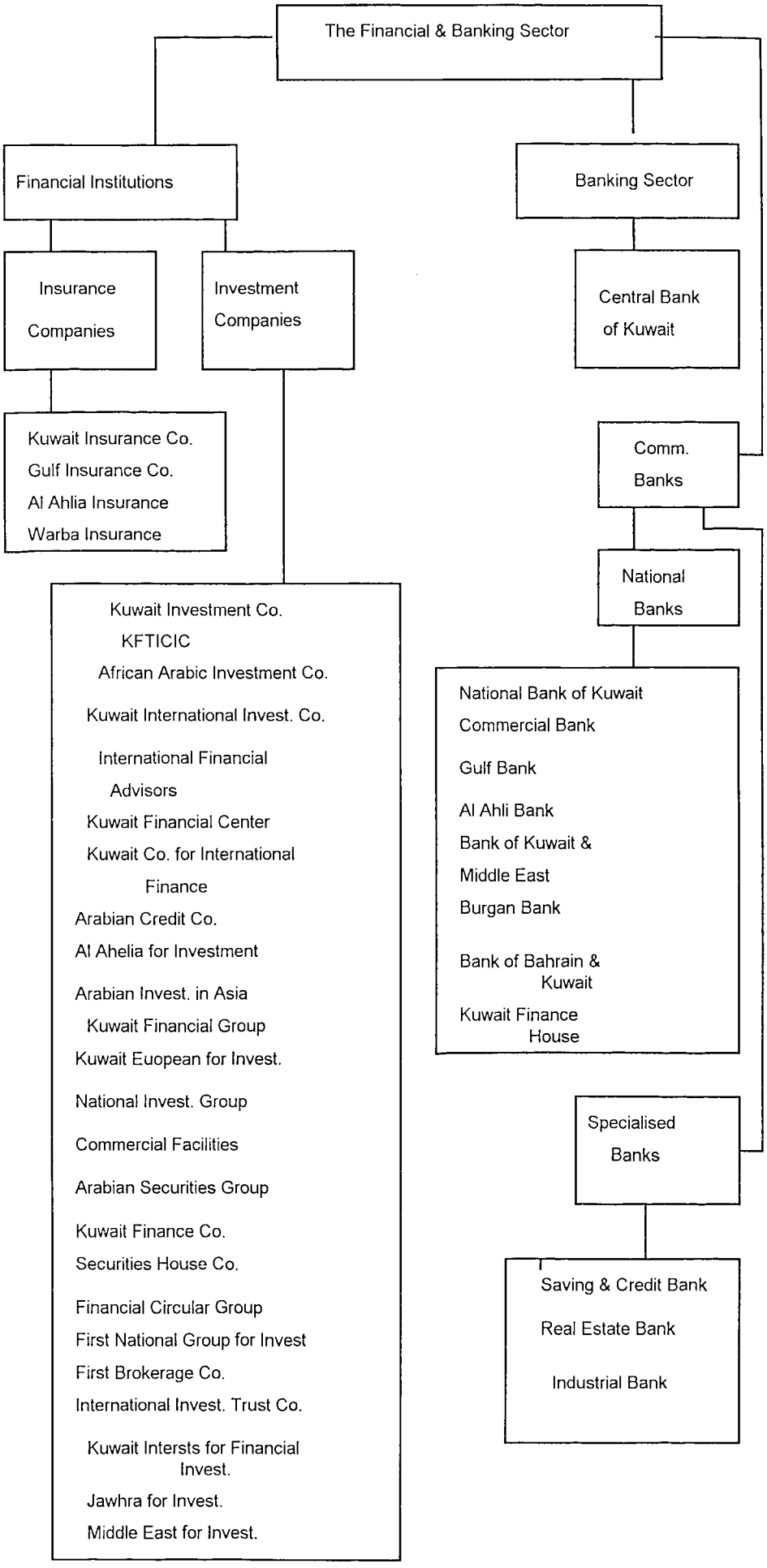
Source: Kuwait Central Bank, 1989, Quarterly Statistical bulletin (June-July)

2.2.3 Development and the Structure of the Kuwaiti Equity Market

The purpose of this section is to describe the historical stages of development of the equity market. The changing face of the economy from pearl fishing and trading to one based on the exploitation of mineral resources has lead to a rapid development in financial institutions.

The success of the first public company (National Bank of Kuwait) led to the establishment of others that led to the announcement of the first regulation for the equity market in 1961, then later to the establishment of the stock exchange in 1977 . The equity market prices experienced a boom until August 1982 when the market collapsed. This led the authorities to change the regulation of the stock market and open a new stock market in 1984. This was followed by a more mature period for the

Figure N0. 2-2: Financial & Banking Sector in Kuwait



market until August 1990 when Iraq invaded the country. This resulted in the closure of the market until 28 September 1992.

The Initial Stage

The period reflected the beginning of the transformation of the economy. Following the discovery of oil in the Burgan field in 1938 the British Bank of the Middle East opened its first branch in Kuwait in 1941. This was the first modern financial institution in the country. Oil generated financial resources were distributed to the citizens through government-established domestic share holding companies in which shares were sold at a discount to nationals.

The Kuwait National Bank was the first to be established in 1952. Its capital of 13,100,000 Rupees[7] was divided into 131,000 shares with a nominal value of 100 Rupees each. It was followed by the National Kuwait Cinema Company in 1954 with a capital of KD 1.630.263, National Airways in 1956, and Kuwait Petroleum Transport Company in 1957 with a capital of KD 25.936.605. Due to this limited share issue there was no securities market. Moreover, there was no speculation - the investors who were involved in share trading were investment minded.

Between 1960 and 1970 many more share-holding companies were established. Nine companies were established in 1961-1962 and eight companies in 1963-1968. Companies and trading began to be regulated by Company Law in Law No. 15 in 1961, and organised trading began after Law No. 27 in 1962.

By the end of 1968 there were twenty-five companies with a nominal capital of KD 100 million, of which forty-three per cent was owned by the

government and fifty-three per cent by the private sector. As the period closed, in 1970, Law No. 30 was issued to regulate share trading through a special advisory committee. The incorporation of the new companies and the increase of the capital of existing ones had increased the activities on the market and expansion of the new issues in this period.

The Second Stage: the Stock Market in the Period 1971-1980.

Law No. 32 of November 1970 established the basis for securities trading. The law was supervised by a department in the Ministry of Commerce and Industry in August 1971. Meanwhile, between 1971 and 1973 there were eleven new companies, between 1972 and 1974 eight companies in the real estate sector alone. The growth of the companies in real estate brought new depth to the market introducing many smaller investors to the market and made it possible for them to participate in the real estate market in which they could not invest individually.

There was a great deal of demand for these new companies. For example, the Kuwait International Investment Company was over-subscribed by 136 times. Furthermore, the general average price of stocks increased from about KD 15 in September 1970 to KD 20.4 in September 1971 and to more than KD 45 at the end of 1973.[8] However, this spectacular increase was not accompanied by similar growth in the assets and profits of the companies or a qualitative change in their performance. For instance, the rise in prices even included stocks of newly established companies that had not started operations.

There was a rise in the number of shares traded from 3.41 million in 1972-1973 to 10.8 million during 1973-1974. Many of these were a result of forward deals which were most significant between 1971 and 1973. The

amount of premium earned through forward deals depended on several factors, including the liquidity, intensity of trading and rates of share's price increases. After these excesses it was inevitable that between January 1974 and the end of March 1975 the market underwent an adjustment to restore the price level to a realistic level.

One major factor in this readjustment was the Ministerial Decision No. 52 of 1974 which prohibited forward transactions in the securities markets. Another factor was that this decline in the value of the shares coincided with a general increase in the international interest rates which proved an alternative attraction to local funds. Finally, Law No. 15 of 1960 was reformed through the Amiri Decree No. 3 of 1975. Under this new rule, the founders of new companies were under legal obligation to check the subscriptions on application forms to prevent applications in duplicate names. In support of the ban on forward trading, this regulation also forbade trading in new companies before the publication of their first balance sheet.

Under enabling legislation to fulfil Amiri No. 3, the nominal price of shares was reduced KD 10 to KD 1 to widen share ownership among the public. As a result, seven new public share holding companies were incorporated between 1975 and November 1976 with a total capital of KD 45.75 million divided into 45.75 million shares which included the Kuwait National Petroleum Company and the Petrochemical Industries Company. These two were fully acquired by the government which then withdrew their shares from the market.

After a decline in 1974, the market revived during 1975 and 1976. Trading among the new speculators increased greatly though this was not

immediately reflected in the prices. Finally, in the second quarter of 1976 the prices rose sharply to reflect the speculation. The average stock price amounted to as much as eleven times its average nominal value and as much as six times its book value.[9]

The speculation of 1976 originated in the real estate sector and passed from there to other sectors in the stock market. It was the result of a huge demand for commercial offices and land which led to the increase of rents and real estate prices. There were several factors which also helped the speculation. These included the easing of credit by the banks for real estate investments, the distributing of housing plots by the government, and the increase of amounts of social and housing loans provided by the Credit and Saving Bank. There were also other related elements. These were: the extension of bank credit facilities which increased liquidity and the resumption of forward deals which went out of the control of the Ministry of Commerce.

Share prices peaked in the second half of 1976, but because this was based mainly on speculation this was followed by a decline in prices and demand. In response the Ministry of Trade and Industry set up a security committee with broad authority for organising securities trading. Action to control the boom in bank credit was taken by the Central Bank.

After 1976, the decline in share values caused confusion among traders for the rate of decline was highest in those sectors which had experienced the largest volume of trading during 1976. Worst affected were companies in the real estate sector. In that sector, the decrease in total turnover was very high and amounted to sixty-four percent. The government introduced different measures to strengthen the market.

In 1977, a stock exchange was introduced. Soon, measures were put in place to regulate forward transactions which involved defining the basis for concluding such deals and putting them under the supervision of the Ministry. As part of these measures the establishment of new companies was suspended and the capital of existing companies was restricted. Later, in December 1977, the government intervened through the Kuwait Foreign and Trading Company and International Contracting (KFTCIC) to buy stocks at the lowest prevailing prices. Moreover, banks were instructed to reduce interest rates on loans and extend the period of repayment for an additional two years, including the possibility of a further extension. Later on, when these measures appeared successful the ban on the establishment of new companies was lifted. The General Warehouse Company was formed in September 1979 as the first company after the ban was lifted.

Stock Market in the Period of 1980-1990.

The stock markets in the 1980's can be divided into two periods which are separated by the Al-Manakh Crisis. I discuss the two periods: before the Al Manakh crisis 1980-1982 ,and after the crisis 1983-1990, in turn.

The historical development of the traded companies in Kuwait stock market can be seen from the table below:

Table 2.4: Kuwait Share Holding Companies:

Name	Total Assets (K.D.)	No. of Shares	Establishment Date
National Bank of Kuwait	3,476,219	773,070	19.05.1952
Gulf Bank	1,897,391	574,771	23.11.1960
Kuwait Commercial Bank	1,786,157	492,688	19.06.1960
Al-al-Ahli Bank of Kuwait	1,752,733	456,936	23.05.1967
Kuwait & Middle East Bank	1,062,704	432,671	24.02.1971
Kuwait Real Estate Bank	514,357	257,428	13.05.1992
Bank of Burgan	1,265,064	580,797	27.12.1975
Kuwait Finance House	1,172,836	261,514	23.03.1977
First Gulf Bank	32,100	12,000	12.05.1979
Bahrain International Bank	104,932	699,604	10.05.1982
Bahrain Middle East Bank	145,030	559,775	5.07.1982
Kuwait Investment Co.	331,730	518,832	25.11.1961
KFCTIC	656,641	540,000	16.01.1965
Kuwait International Invest.	146,905	319,022	22.09.1973
Commercial Facilities	75,136	105,193	13.11.1976
International Financial Advisor	33,131	335,000	30.01.1974
Pearl of Kuwait	81,200	59.8	1975
Investment Co.	81,182	598,102	5.02.1975
Kuwait Investment Projects	70,443	488,755	2.08.1975

National Investment Co.	127,194	557,041	6.09.1987
Coast Investment & Development	64,270	440,000	27.07.1980
Arabian General Investment Corp.	36,241	581,518	25.04.1979
Kuwait Insurance Co.	79,130	160,000	30.07.1960
Gulf Insurance Co.	40,640	113,100	09.04.1962
Al-Ahli Insurance Co.	35,960	80,000	12.06.1962
Warba Insurance Co.	17,666	57,531	24.10.1976
Arab International Insurance Co.	2,379	16,800	8.03.1981
National Industries Co.	102,022	242,975	8.01.1961
Kuwait Metal Pipes Manufacturing Co.	31,990	152,070	24.08.1966
Kuwait Cement Co.	43,904	256,163	09.11.1968
Refrigeration Industries Co.	19,232	66,862	8.03.1973
Gulf Cable & Electrical Industries	41,965	56,345	15.03.1975
Kuwait Pharmaceutical Indust. Co.	17,112	99,193	25.06.1980
Kuwait shipbuilding & Repair yard Co.	18,882	251,004	2.04.1974
Contracting & Marine Services	28,020	75,000	13.09.1973
Umm Al-Qaiwain	22,262	636.900	11.2.1982
Cement Industries Co.	17,814	195,000	11.02.1982
Kuwait Real Estate Co.	128,073	450,000	16.05.1972
United Real Estate Co.	93,034	767,754	4.04.1973

National Real Estate Co.	62,349	360,544	16.07.1973
Salhiah Real Estate Co.	40,569	192,000	16.09.1974
Livestock Transport & Trading Co.	42,022	216,618	28.11.1973
Kuwait United Fisheries	10,721	70,000	07.02.1972
Kuwait United Poultry	17,119	115,404	30.11.1974
Kuwait Foods Co.	40,367	1123,878	29.09.1963
Over Land Transport	8,205	49,927	6.07.1977
Kuwait National Cinemas Co.	16,157	70,000	5.10.1954
Kuwait Hotels Co.	9,174	50,000	12.06.1962
The Public Warehousing Co.	36,924	269,338	17.09.1979
Kuwait Commercial Markets Complex Co.	14,238	115,102	9.02.1982
Mobile Telephone Systems Co.	42,180	249,998	9.01.1983
Kuwait Computer Co.	6,759	50,625	22.03.1983
Gulf Medical Projects Co.	5,873	67,500	1.08.1979

Source: Kuwait Stock Market, Annual Report, Various Issues.

A: 1980-1982 (Before Souk Al Manakh Crisis)[10]

Following the establishment of the General Warehouse Company in 1979, in 1980 two other new companies were incorporated - the Kuwait Pharmaceutical Company with a capital of KD 6 million and the Kuwait International Company for Petrol Investment. The latter was concerned with overseas work in the refining industry, transport and storage industries and seventy percent of the shares offered were owned by the government. The fact that permission was given to the creation of only

three companies led some investors to establish new companies in the other Gulf States.

Consequently, the restrictions were relaxed. In 1981, two new types of companies were created; closed joint companies and Gulf joint stock companies. By December 1981, there were six companies allowed to offer shares to the public, with a total capital of KD 51 million. Two Gulf[11] companies, the Gulf Agricultural Development Company and Gulf Real Estate Investment Company, were also registered amounting to 33 KD million. There was much interest for share trading of the Gulf companies which led to the formation of local offices to conduct local transactions in what was called Souk Al-Manakh.

The significant interest of share trading in these companies led to the creation of a consulting committee chaired by the Ministry of Trade and Industry. The committee offered several proposals to regulate such companies. These included proposals for the following: the regulation of the trading of the Gulf companies; regulation by the Ministry for any changes related to these companies (for example. capital adjustments); the guidelines provided by the Ministry concerning the status of a company, should be taken into consideration.

Again, the interest in the companies caused their prices to reach high levels. Nevertheless, the absence of proper control affected the performance of the official market. A foretaste of the Al-Manakh Crisis came in August 1982 when trading was reduced to 72 million shares against 602 million in the previous month. Several factors contributed to this crisis. They are in sum; a surge of forward cheques for huge amounts, a high level of prices because of the heavy demand which was not related

to any financial logic and speculation on the unofficial market due to lack of regulation and control.

B: The Stock Market During the Period 1983-1990.

During this recent period, the market was subjected to a number of new regulations and measures intended to maintain economic development and prevent a recurrence of the Crisis.

The government introduced several measures in response to the Al-Manakh Crisis which included fixing the maximum capital payable to creditors. Many of these had post-dated cheques and were willing to cooperate with the government in order to solve their problem through a specially constructed trust fund. Under the rules of this fund any amount up to KD 25 thousand was to be paid in cash to the creditor and the balance collected in the form of bonds with a maturity range from six months to six years.

Another response to the Crisis was creation of the Forward Shares Transaction Settlement Corporation in April 1983. Its function was to undertake the settlement of transactions, and also to evaluate the assets of people referred to the corporation. Another one of its functions was that it was legally authorised to manage, liquidate and execute settlements and, furthermore, to act on behalf of creditors whose debts resulted from forward share transactions.

On 14 August 1983 a further Amiri Decree was introduce in order to regulate the securities market. An independent committee was set up to manage the market and the Minister of Commerce was appointed its Chairman. This Committee have several functions, but the most significant

functions of this Committee were to deal with the application of rules to regulate securities, the supervision of securities transactions. Furthermore, the Committee was empowered to act against any unlawful act on the market and to stop deals on the market when it became necessary.

Further regulation was introduced in November 1983. These brought new measures for the following important subjects: market objectives, management, membership, budget, disputes, and arbitration. They also specified preconditions for brokerage; the company and all its partners must be Kuwaiti, the brokers must be Kuwaitis with good qualifications and considerable experience, and those holding positions of management should not either have a criminal record or have been declared bankrupt. Finally, for brokerage companies the Committee required bank guarantees which would act as a ceiling for the sums the company could deal with.

Another forward step for the equity markets was the opening of the new stock exchange building in September 1984, which operate with the application of the system of written bidding in trading transactions, was opened. This was accompanied with internal rules and memorandum to improve the operation of the market itself.

To continue solving the accumulation of the Crisis various laws were established. One law was issued concerning the deposition of joint stock company shares and securities aimed at recognising the legitimacy of the disposition of joint stock company shares and of trading covering the unlicensed Gulf shares. Another law was the Ministerial decision

concerning the preparation and submission of these companies' final accounts.

In October 1985, the government suspended trading the Gulf shares pending an assessment of their value. This review was undertaken by the Central Bank. Following this review of thirty-three companies, four of them were liquidated, a further four were merged. The board of directors of eleven more were changed, and the exclusive management of another ten were also changed. This review also involved companies which were not open to public ownership. Following this review of sixty-two private (closed)[12] companies three were closed, twenty-five were liquidated and a further five were merged.

Following a review of the stock market in Kuwait, two strategies were implemented to help channel savings toward profitable investments. These initiatives began in 1986. The first policy was intended to stabilise market turnover and to restrain speculation Those companies which had survived the review were felt to be solid and it was felt that increasing new issues by existing companies and forming new companies would channel saving toward real investments.

The second policy involved the specifying of rules for the new exchange. These included the following: (a) a committee to supervise the new stock exchange to be made up of several bodies: the Minister of Finance, a representative of the Chamber of Commerce, the Central bank, and stock brokers (b) bids are to be made in writing (c) traded shares are to be divided into units of 500 to 100.000 shares in crder to avoid price fluctuations. (d) the financial position of the listed companies could be checked by the stock exchange (e) 39 public share holding companies

and 9 closed[13]companies to be traded on the stock exchange. The unofficial market would be created on the main floor with 30 Gulf companies (f) there would be an annual fee of KD 10.000 incurred, plus 0.001 per cent of the capital of the listed companies (g) broking would be conducted by a firm with a minimum capital of KD 100.000 and security deposit of KD 250.000 (h) eleven stock Broking firms were licensed (i) two companies would act as market makers (Security Group and Securities House) (j) Kuwaiti Dinar Bonds would be admitted to the stock exchange.

Several rules for regulating the market's activities were issued by the authorities. A price unit system was set to soften the speculations. This provided that price increment during the trading session should not exceed five points. A Ministerial Decision No. 5 entitled the management to specify the brokerage companies through which foreword shares might be traded and provided that the differential between the price of a forward transaction and its spot price should not exceed 25 % of the total value of the transaction.

Decision No. 16 on listing and regulating the work of market makers stipulated that a company should be share holding company or Kuwaiti financial institution , while its paid capital should not be less than KD 10M.

The third rule resulted in decision No. 132 which amended the provisions of the commercial companies law. The first amendment divided all public companies' shares into units worth one tenth of their value. The second amendment authorised companies to buy up to 10% of their own shares. The third amendment was to reduce the procedures for share title transfer. A fourth Decree regulated the procedures of securities trading settlement and the clearing room at the Kuwaiti securities market.

The following table shows the number and the value of the traded shares for the years 1985-1992. The year of 1988 shows an increase volume of the traded shares and that mainly dependent on the stabilisation of the region when the Iraq-Iran War finished. Also, it is noticeable the effect of the Gulf War on 1990 on the market activities from 1990-1992.

Table 2.5: Kuwait Stock Market Value of Traded Shares (Official Market)

Period	No. of Shares Traded (Million KD)	Value of shares Traded (Million KD)	No. of Transaction
1985	179.3	116.3	11229
1986	478.5	384.6	25236
1987	970.5	828.9	74526
1988	2798.3	710.7	63977
1989	1613	502.1	33506
1990	754	260.3	13810
1992	302	116.3	9100

Source: Kuwait Central Bank, (1989), Quarterly Statistical Bulletin (June-July).
Kuwait Stock Market, Annual Report, Various Issues.

In general, the trading on stocks of public share holding companies' shares must be through the stock market. The exchange operates through a conservative auction system which permits only moderate price changes limiting the scale of daily movements in individual shares. When the market is going in one direction, the market makers (Securities Group and Securities House) are instructed to buy and sell shares.

The new stock exchange is believed not following its original function since there was a lack of participants in the market, attributed to the large-scale government ownership of shares. It is believed that the government in 1987 owned more than 50%[14] of the shares of the 47 listed companies[15].

As can be seen, the market has gone through different stages of development. In the initial period more new companies were established with a large number of them established between 1960-1970. In the 1970's , trading increased as result of organising the secondary market. In 1977, the Stock Exchange was opened, followed by a large volume of trading. The then market collapsed, as a result of speculation and lack of regulation in Souk Al-Manakh in August 1982 .The government stood strong by offering and imposing different solutions and measures. This led to the adoption of new regulations and further measures to prevent a crisis similar to that which occurred in Al-Manakh. A new stock exchange opened in September 1984 under the supervision of a representative committee. Until 2 August 1990 (the Iraqi invasion of the country), the market witnessed a stable and more mature period.

2.3 Saudi Arabia

2.3.1 The Country Background

Saudi Arabia covers about four-fifths of the Arabian peninsula and has an estimated area of 2.15 million sq. km. The international borders to the south and east with the Yemen Arab Republic, Oman and the United Arab Emirates are recently defined, while in the settlement of frontiers with Kuwait and Iraq in the Northwest an attempt was made to protect the rights of the region's nomadic population. The country is divided into four regions: Hejaz (Northwest); Asir (Southwest); Nejid (central plateau); and

al-Hasa (Eastern province) on the Arabian Gulf. South of Nejd lies the Rub' al-Khali, or empty Quarter, where climatic conditions are generally too harsh to support any kind of civilisation. The west coast is separated from the central plateau by mountains, which provide more regular rainfall and some agricultural potential in the Southwest. Oil and gas production to date has been carried out in and off-shore in the low-lying Eastern province, where several large oasis settlements are also located[16].

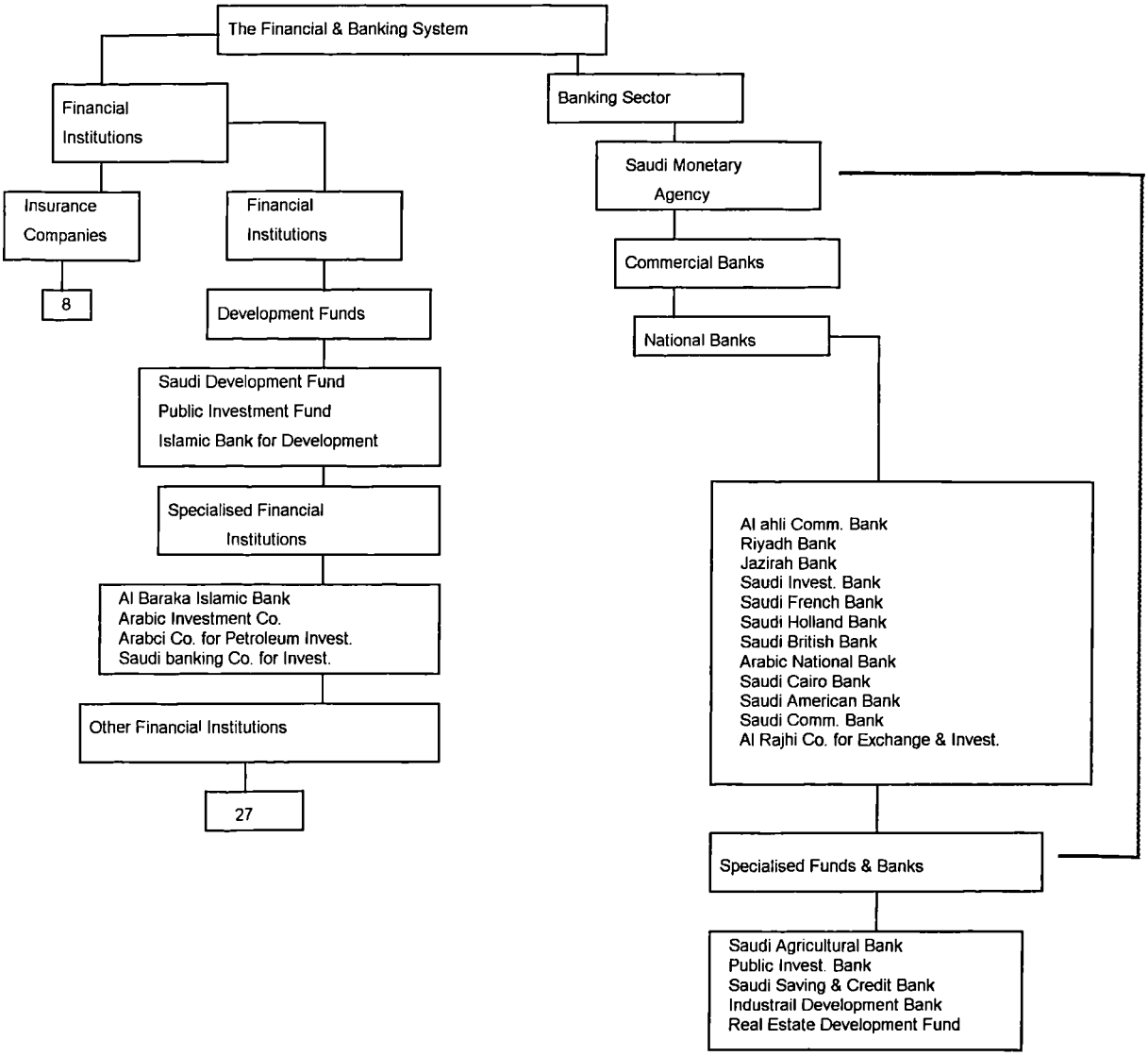
Apart from Saudi Arabia's oil and gas reserves, there are believed to be sizeable deposits of other minerals. Although at present only salt, limestone and gypsum are produced commercially, old gold and silver mines in the western mountains have recently been reopened, and deposits of phosphate, copper, bauxite and uranium are considered to be of economic potential.

The 1992 Saudi census gave total population of 16.9 million people of whom 12.3 Saudi nationals and 4.6 million resident foreigners. The annual rate of growth of population in 1992 was 3.3 percent (Metz, 1992). The 1970s and early 1980s the pace of economic development and the demand for labour prompted a situation in which many Saudi nationals migrated to the towns, creating a shortage of agricultural labour. Also the government and private sector were in competition for employees, with the result that the significant increase in employment of Saudi nationals in many sectors was obscured by an even greater increase in expatriate employment. In 1985, the civilian work force totalled 4,446,000 of which Saudi nationals represented 40 per cent. The overall work force, and the number of expatriates, are both considered to be below the1985 levels at present, with the fall in foreign workers being proportionately much larger (Phillimpan, 1989).

2.3.2 The Financial and the Banking Sector.

The main authorities concerned with finance in Saudi Arabia are the Ministry of Trade, the Ministry of Finance and National Economy, and the Ministry of Labour and Social Affairs. However, the only authority directly concerned with the working of the financial system is the Ministry of Finance and National Economy. These are four main aspects of supervision which I shall discuss in turn. These are the Saudi Arabian Monetary Agency (SAMA), the commercial banks, specialised government institutions, and investment sources (Pillimpan, 1989).

Figure N0. 2-3: The Saudi Financial & Banking System



Saudi Arabian Monetary Agency (SAMA).

SAMA was established in 1952 to supervise the banking and financial sectors, monetary policy and foreign asset management on behalf of the government.

It regulates foreign exchange bank deposits. One of its functions is to regulate the markets to ensure that they conform to the Islamic law and that no interest is paid. When share trading became regulated in 1985, SAMA was made the responsible authority, and a new department called "Shares Control" was established to supervise the day-to-day trading of shares through commercial banks.

Commercial Banks and Money Changers:

The first commercial bank to be established in the Kingdom was a branch of the Netherlands Trading Society in 1927. This was followed by other banks, some foreign, some local such as - the National Commercial Bank in 1938, followed by the Riyadh Bank in 1956. (See table 7).

From 1976 to 1983 the government pursued a Saudization policy which involved transferring the foreign banks into Saudi joint stock companies. The Saudization of foreign banks resulted in the formation of new banks: Al-Jazirh Bank, Saudi Investment Bank, Saudi Holland Bank, Saudi French Bank, Saudi Cairo Bank, Arab National Bank, Saudi American Bank, Saudi United Commercial Bank, Saudi British Bank, Riyadh Bank, Al-Rajhi for Exchange and Investment.

Consequently, 60.6% of the ownership of these banks was transferred to the Saudi private sector which provided SAMA with a greater control of the private sector. Saudization had two further effects. It provided local

investors an opportunity in the domestic economy, and second, it increased the capitalisation of the banks which widened their financial market capabilities.

Table No. 2.6: Total Assets of Saudi Commercial Banks (Millions SR)

End of the Period	Total Assets
1987	191,059
1988	216,239
1989	233,585
1990	232,055

Source: Saudi Monetary Agency, (1990), Annual Report.

The widening of the financial market capabilities resulted in more competition between the commercial banks especially in the increased role in short and mid-term financing, and through the increase in the number of branches. The commercial banks began to offer interest on the saving and deposit accounts despite the prohibition against usury The banks were offering loans and charging interest, calling it a service charge. However, when the customer failed to repay the loan, banks could not legally claim it back, and that, in general, made the market restrictive and conservative.

During the increase in oil prices in the 1970s and the Second Development Plan (1975-1980), banks were encouraged to become more flexible in loan security requirements. Later, this policy was to have a negative effect on banks when the price of oil declined and that is to have

a difficulty of claiming their loans and interest from customers (because of the interest charged).

Commercial banks also faced competition from the bureaux des changes who performed most of the banks' activities up until 1982. There were four major companies which had 250 branches. Then a new regulatory regime was adopted by SAMA. An important change was the proof of the financial soundness of the money changers was needed, before licenses were given.

In 1983, SAMA introduced a further regulation which was aimed at preventing the money changers from receiving new deposits. By 1985, money changers were restricted only to currency exchange. If they wanted to engage in the range of activities they had previously done, they would have to register as commercial banks. Thus, large companies such as Al-Rajhi for Exchange and Trade registered as a bank under a new name Al-Rajhi Exchange for Investment.

The regulation of share trading in 1985 further added responsibilities to the commercial banks since it restricted share trading to their branches. Table 2.7 shows the number of branches of commercial banks.

Both banks and bureaux des changes have played an important role in the equity market. For example, Al-Jazirah Bank holds a stake in the Saudi Real Estate Company and five per cent in the Saudi Investment Bank. Also the Saudi Investment Bank is also sixteen per cent equally owned by the National Commercial Bank and the Riyadh Bank. Other examples are easy to find. The National Commercial Bank also holds shares in Saudi Ceramic, National Gas, Al-Yamamah Cement, and Saudi Real Estate. The

bureau de change which recently registered as a bank, the Al-Rajhi Exchange for Investment also owns a significant number of shares in eight Saudi joint stock companies. As can be seen from here, the government connected institutional investors in Saudi Arabia thus consititute important and significant blocks, which make the Saudi stock market different from Kuwait.

Table 2.7: Saudi Commercial Banks Operating Branches

Name of Banks	Head Office	Total Branches
National Commercial Bank	Jiddah	229
Riyadh Bank	Riyadh	161
Saudi Cairo Bank	Jiddah	47
Saudi French Bank	Riyadh	64
Arab National Bank	Riyadh	110
Saudi British Bank	Riyadh	42
Bank Al-Jazira	Jiddah	26
Saudi American Bank	Riyadh	35
Saudi Holland Bank	Riyadh	28
United Saudi Commercial Bank	Riyadh	12
Saudi Investment Bank	Riyadh	7
Al-Rajhi Banking Investment Corporation	Riyadh	271

Source: Saudi Monetary Agency, (1990), Annual Report.

Government Specialised Credit Institutions.

The prime source of these institutions is the government. They are a major source of the loan market in Saudi Arabia and they were established

during the first government plan period 1970-1975: The Saudi Agricultural Bank, The Real Estate Development Fund, Saudi Industrial Development Fund, The Specialised Funding Programme and Public Investment Funding.

The Saudi Agricultural Bank supplies the finance for implementing agricultural projects while residential and commercial construction projects are financed by the Real Estate Development Fund. The Saudi Industrial Development Fund focuses on financing electricity and long-term manufacturing projects. The Specialised Funding Programme has a wider range which includes funding for contractors, bakeries and importers of heavy equipment. Saudi Credit Bank finances small vocational business.

These government credit institutions are not competitors to commercial banks, they offer around 3% as a service charge on their medium and long term loans. During the Second Development Plan between 1975 to 1980, the loan amounted to SR. 61,780 million excluding loans advanced by the Public Investment Funding. The Public Investment Funding finances a large scale development projects on equity as well as on a loan basis. It participates particularly in Saudi joint stock companies. The participation of these specialised credit Institutions has a positive effect in terms of the liquidity available to the financial market. The tables that follow below show the total assets of the Credit Disbursements by the Saudi Specialised Credit Institutions(Millions Rls):

Table No. 2.8: The Total Assets of Saudi Specialised Credit Institutions(Million SR)

End of Period	Total Assets
1987	197,570.9
1988	197,334.9
1989	196,684.7
1990	203,780.2

Source: Saudi Monetary Agency, (1990), Annual Report.

Table No. 2.9: Credit Disbursements by the Saudi Specialised Credit Institutions(Millions Rls)

Name	1987	1988	1989	1990
Saudi Agricultural Bank	694	627	651	664
Saudi Credit Bank	273	288	324	274
Public Investment Fund	382	130	40	364
Saudi Indust. Dev. Fund	542	440	828	667
Real Estate Dev. Fund	3,972	3,389	2,978	2,445

Source: Saudi Monetary Agency, (1990), Annual Report.

Government Secondary Investment Sources.

In addition to direct influence by government, a number of government agencies have indirect or secondary influence. The General Organisation for Social Insurance and Retirement Pension Agency have both contributed to the financial activities in Saudi Arabia. Their goals of establishment are:

1) To generate their own revenue.

2) To support the development projects of the country-and thus, they both participate in the capital ownership of various Saudi Joint Stock Companies.

Their participation on the equity market can be seen in the holding of different percentages of ownership in the traded companies. The Retirement pension agency holds 10% of the Saudi Kuwait Cement

Company and around 3% in Real Estate and Taibah Companies while the General Organisation for Social Insurance holds 10% of Yanbah cement Company, Saudi Cement and SAPTCO. It also holds 8% in the Saudi Investment Bank and 5% on seven traded Companies.

Private Credit Institutions.

The concern of private credit Institutions is to finance short term projects mainly for domestic requirements and small companies. They are licensed by the Ministry of Trade. They have a limited effect on the financial market, mostly because they use the Islamic way of financing , referred to as 'Murabahah' and also lease-purchase finance.

The Private Sector.

The government in Saudi Arabia has promoted the role of the private sector in building the infrastructure of the country. As a result, the private sector enjoys several incentives including interest free loans from some of the government agencies discussed above, exemption from custom duties for raw materials and plant machinery, and public procurement policies favouring private local investors.

Private sector companies range in size from small businesses to large multinational corporations. These are generally established as joint stock companies. Since 1982, establishing a joint stock company requires registration with the Ministry of Trade. There are five classes of company which require registration as a joint stock company directly from the Council of Ministers. These are concessionary companies, companies managing public utilities, companies receiving subsidies from the government, companies in which the government or government agencies are involved, and companies which are involved in banking

2.3.3 Development and the Structure of the Saudi Equity Market

In the 1960s, there were few Saudi joint stock companies. The number increased in the 1980s to thirty-seven joint stock companies with $ 5.7 billion of capital. The number of companies has increased substantially to seventy-eight joint stock companies in the 1990's of which sixty are public joint stock companies with a combined capital of $ 18 billion by 1992. This section will procedure to give a description of the different stages of development of the Saudi equity market.

The Initial Stage:

The first public joint stock company - a limited liability company in which shares could be purchased by the public - was established in 1935. This was the Arabian Automobile Company. The company failed and was quickly liquidated. The oldest of the public joint stock companies still trading is the Arab Cement Company which was made public in 1954. Since the country at that time lacked even basic facilities, the main companies which were established were in basic industries such as cement, construction and electricity.

Only later were companies established in the financial sector. In 1956, the Riyadh Bank was established with a capital of SR 50 million. Similarly, the first joint stock company with foreign equity was only established in 1963. The Arab Petroleum Exploration company was formed with a capital of SR. 10 million of which forty-nine per cent was held by foreign partners. By 1964, there were seventeen joint companies with a capital of SR 2955 million consisting of 28.9 million shares. Most of these companies were in the basic industries.

The growth of the equity market really occurred after the announcement of the Company Act (1965/1385[17]) which made it easier to become established as a company. Between 1965 and 1974 thirty-seven new companies were established with SR 3,000 million in capital. However, these were still in the basic industries. Thirty one of them were in the electricity industry. Of the remaining six, four were closed joint petroleum companies, i.e. without their shares traded publicly, and the remaining two companies were the Saudi Arabian Fertiliser Company and the National Gas Industry Company.

At that time share investment was limited partly due to lack of awareness of trading and the related tendency to retain shares for a long time, and partly due to the small size of the traded market. These problems were overcome by the establishment of the Beirut stock exchange followed by the introduction of share regulation in Kuwait. Eventually, these regulations culminated in the formation of a stock market in Kuwait in 1977, and later a stock market was also established in Oman in 1978. As increasing numbers of investors were attracted to the markets, there was an increase of activity and sophistication.

The economic boom starting in 1974 (1394) due to the boom in oil revenues led to an increase in individual savings which was often invested in the share market. The following table shows the increase of oil revenues earned by the Saudi state.

Table No. 2.10: Saudi Arabia Public Oil Revenues (U.S. $) 1972-1976.

Year	1972	1973	1974
Total	2,744	4,340	22,573
Year	1975	1976	1977
Total	25,676	30,754	36,540

Source: Saudi Arabian Monetary Agency, Annual Report, Various Issues.

This boom period coincided with the Second Development Plan (1975-1980). During this period, a further forty-five joint stock companies were established. Ten of these were closed-joint-stock companies whose shares are not publicly traded. Another four companies were originally closed but share issues have recently been offered to the public. However, these companies are not yet publicly traded. The other thirty-one companies were established as publicly traded companies. The increase in share trading activities led to many small offices, particularly real estate offices, becoming involved in share dealing (Philmpan, 1986).

Moreover, in 1976, the government provided a further incentive to the economy with the creation of the Saudi Arabian Basic Industries Corporation (SABIC) with a capital of SR 10 milllion and 10 million shares. (Later, in 1984, thirty per cent of these shares were sold to private local investors as part of government plans to strengthen the private economy.) This period also witnessed the growth of concentration in the economy as the electricity companies started to merge for reasons of economic efficiency into regional companies.

During the Third Development Plan, 1980-1985, there was Saudization of the five remaining foreign banks through mergers. Two new banks were formed: the Saudi American Bank and the Saudi United Commercial Bank (60% Saudi ownership). This nationalisation enlarged the base of the shareholders as these new companies were publicly quoted and encouraged share trading. Another noticeable increase occurred in the number of publicly traded companies in this period of economic prosperity. Fifteen new companies were floated in different sectors with total paid-in-capital of Saudi Riyals SR 21 billion (SR 3.75= $ 1 US) were offered to the public (Al-Dukheil, 1988).

One important feature of these IPO's was the insistence of the government that the shares were offered at a par value (far below the actual value of these shares) as a form of redistributing to the general public the recent oil-generated revenue. The government move also succeeded in increasing shareholder interest in the Saudi stock market. The creation of new companies and the involvement of many investors in share trading encouraged many more brokers' offices to be established. However, because of the pace of these developments there was an inadequate regulatory framework. These offices were opened and operated without any permission or formal regulation, or required skills or indeed experience in dealing and trading with shares. This growth of speculation contributed to increases in the values of share prices.

The table below shows the historical date and the size of Saudi joint companies.

Table No. 2.11: Saudi Traded Companies (1991)

Name	Total Assets	Establishment Date	No of Shares
Riyadh Bank	44,408,884	1965	2,000,000
Jizirah Bank	3,895,511	1976	1,000,000
Saudi Investment Bank	4,601,248	1976	900,000
Saudi Holland Bank	9,524,322	1977	2,100,000
Saudi French Bank	18,787,350	1977	4,000,000
Saudi British Bank	14,577,936	1978	4,000,000
Saudi Cairo Bank	11,425,578	1979	6,000,000
Arab National Bank	14,383,252	1979	6,000,000
Saudi American Bank	29,872,479	1980	6,000,000
Saudi United Commercial Bank	6,237,092	1982	2,500,000
Al-Rajhi Exchange.for Investment	18,510,727	1988	7,500,000
Industry Sector:			
Saudi Basic Industry (SABIC)	32,851,575	1976	100,000,000
Saudi Fertilisers (SAFCO)	2,278,519	1385	2,000,000
Saudi Refineries	70,360	1959	400,000
Saudi Ceramic	329,825	1978	1,500,000
Saudi Vegetable Oil	359,095	1979	1,200,000
National Industries	376,660	1985	6,000,000
Saudi Pharmaceu. Ind.	616,363	1963	3,000,000
National Gas & Ind	1,178,598	1963	5,000,000
National Gypsum	121,803	1958	720,000
Cements Sector:			
Arabian Cement	990,231	1956	12,000,000
Saudi cement	669,611	1957	8,400,000

Al-Yamama Cement	1,177,186	1959	9,000,000
Al-Qasim Cement	621,187	1978	3,000,000
Southern Cement	1,139,617	1979	7,000,000
Yanba Cement	769,645	1979	7,000,000
Saudi Bahrain Cement	1,061,291	1981	12,000,000
Saudi Kuwait Cement	1,199,606	1984	6,450,000
Services Industry:			
Saudi Hotels	756,550	1977	5,000,000
Saudi Real Estate	1,598,531	1977	6,000,000
National Shipping	1,599,809	1977	25,000,000
Saudi Public Transport	1,466,974	1979	10,000,000
Saudi Automobile Service	402,272	1983	6,000,000
Saudi Live Stock	270,290	1982	5,000,000
Tihama for Advertisement	270,290	1975	5,000,000
Assear Trading	179,127	1977	2,000,000
Taibah for Investment	53,775	1987	500,000
Electricities Sector:			
Saudi Consolidated Electricity.(Central)	22,892,471	1979	80,000,000
Saudi Consolidated Electricity.(West)	24,000,166	1982	73,000,000
Saudi Consolidated Electricity.(East)	24,050,884	1979	42,000,000
Saudi Consolidated Electricity (South)	8,370,540	1981	40,000,000
Tabuk Electricity	N.A.	1972	N.A.
Arar Electricity	N.A.	1969	80,297,000
Domat Al-Jandoul Electricity	N.A.	1974	500,000,00.
Tayma Electricity	N.A.	1977	N.A.

Hakel Electricity	N.A.	1976	N.A.
Rafha Electricity	N.A.	1973	N.A.
Agricultural Sector:			
National Agricultural Development	999,615	1978	4,000,000
Al-Qasim Agricultural	349,540	1985	5,000,000
Hail Agricultural	692,988	1983	3,000,000
Tabouk Agricultural	466,587	1984	2,000,000
Saudi Fishers	305,139	1981	1,000,000
Eastern Agricultural	99,793	1986	3,600,000
Al-Jawf Agriculture	122,902	1988	2,000,000

Source: Saudi Monetary Agency, Annual Report, Various Issues.
Saudi Registration Company, (1991), The Saudi ShareHolding Companies, June.

In part, this was based on the remarkable progress of the economy, and in part on the government initiatives. The selling of thirty percent of the government quota in SABIC in 1984 for 10 million Saudi Riyals (1000 S.R per share) further increased interest in the stock market. Shares were restricted to individual Saudi citizens, with the exception of ten percent reserved for GCC citizens. The offer was over-subscribed by three times. The Ministry of Commerce furthered the policy of broadening the base of investors by giving one hundred percent subscription to individuals who applied for only five shares, and seventy percent subscription to those who applied for ten shares. These two categories obtained fifty percent of the whole offer. As a response to this policy many individuals adopted a strategy of subscribing by applying in the names of their direct families. The SABIC offer was followed by offers from Al-Ghasim Company in which the share issue was ten times over-subscribed.

The growth of speculation in share trading prompted the government to start a regulatory regime to assist the longer-term development of the stock market. Procedures were instituted to prevent a recurrence of the crisis of unofficial stock markets which had taken place in Kuwait in 1982 which were widely blamed on the speculative tendencies in that market.

The Second Stage:

Until 23 December 1984, the government did not regulate stock trading. About eighty stockbrokers informally intermediated between buyers and sellers of stocks. These brokers operated without licenses and did not meet any capital requirements. The attitude of the government changed after the Al-Manakh crisis in Kuwait which was discussed in section 2.2. A study was ordered in Saudi Arabia to evaluate the current market in Saudi Arabia as a means of preventing a similar crisis. The study concluded that:

1) There was a lack of investing awareness on part of investors and brokers.

2) Illegal practises and misuses were being conducted on the market.

3) The share volume available for trade was small.

4) The whole market was divided into a range of small markets, each with its own brokers, investors and speculators.

5) There was an increase of unpermitted brokers' offices.

6) many brokers were acting Illegally as result of:

   a) limited resources (only a telephone and desk).

   b) Discrete contribution to the market rather than a continuous one.

   c) No sense of social responsibility on the part of the brokers' offices.

Legislative action followed and the Council of Ministers soon felt in necessary to announce Decree No. 1320/8 (11-7-1404/1984) for

regulating the trade of shares. Trading would be restricted to commercial banks from 1985 (1405). One limitation of these measures was that there was no specific mention of the role of the brokers against whom the measures had been targeted. Clients could still approach brokers but from now they would need to operate through banks for the legal transactions. The authorised banks for share trading were: Al-Jazirh Bank, Saudi Investment Bank, Saudi Holland Bank, Saudi French Bank, Saudi Cairo Bank, Arab National Bank, Saudi American bank, Saudi United Commercial Bank, Saudi British Bank, Riyadh Bank, and Al-Rajhi for Exchange and Investment.

The groundwork for a new system of regulated stock trading was established by SAMA in June 1984. It issued a circular to the relevant banks which system established the following:

1) An independent supervisory body for all trading in securities.

2) The day-to-day supervision of trading by a body called the Shares Control Administration Division (SCAD) under the jurisdiction of SAMA.

3) The formation of a new separate securities company by the eleven selected banks in Saudi Arabia which is discussed below..

In 1985, the banks created the Saudi Shares Registration Company (SSRC) This company had a capital of SR 11 million which was equally contributed by the ten commercial banks and Al Rajhi for Currency and Exchange. This new company would co-ordinate the buying and selling of orders between bank branches. The banks themselves would have brokers. The commission chargeable by these brokers was fixed by SAMA as in the table below:

Table No. 2.12: Classifications of Share Prices Commission

SR 1-10,000	,005
SR 10,001-100,000	,0025
SR 100,001-500,000	,0015
SR 500,001 or more	,001

Source: Saudi Monetary Agency, Share Control Department Internal Publication.

The above commission is to apply to all dealings shared equally by the buyer and the seller. Forward dealings and post dated cheques were prohibited. The market activities starting from 1987 is seen through the following table:

Table 2.13: Annual Movement of the Saudi Traded Shares in 1989-1991

Period	Value of shares Traded	No. of Shares Traded	No. of Transactions
1987	1,685,517,397	12,012,327	23,267
1988	2,036,786,693	14,641,327	41,960
1989	3,363,686,168	15,518,9010	110,030
1990	4,403,235,482	16,938,386	90,559
1991	8,181,000000	29,275,000	88,689

Source: Saudi Arabia Monetary Agency, (1990), Annual Report.
Al Jazirah Newspaper, (1994), Financial Market and the Economy, January.

These measures were adopted by SAMA to assist in the government objective of creating a central trading hall. However, when this hall was opened in May 1987, it was soon closed and has not re-opened. This researcher could not ascertain the reasons for this decision. Unlike the history of the western markets which are developments of private capitalists, the Saudi market has had heavy government regulation and influence from its inception.

By the end of July 1990, the share trading system was fully automated (the Electronic Information System - ESIS) whereby the selling and the buying is conducted through the system without the presence of the buyer or the seller. The aim of this system to increase the liquidity of the market.

The procedure for trading in the Saudi stock market is as follows: an application for buying or selling has to be filled out by the customer in any of the selected commercial banks specifying the amount and the preferred price for the deal. The payment is payable in advance in case of buying shares. Buyers or sellers orders are first to be matched with similar orders in the bank network, and second through the trading unit of other banks through a clearing office at SAMA.

In sum, the market has passed through different stages which are related to the level of development of the economy. The increases in the oil revenue expanded the development plans run by the government. This helped in establishing more new companies and expanding the capital of the existing companies. In the 1980s, in part due to government sell-off, the trading of these shares increased remarkably. Moreover, certain measures were taken to prevent any market crisis occurring similar to the Al-Manakh Crisis in Kuwait in August 1982. Furthermore, in 1984 a new regulation for the equity market was adopted, with trading to take place through the units of commercial banks under the supervision of the Saudi Arabian Monetary Agency. Trading on secondary market has improved, as has been the objective of the government officials. The hand of government regulation is persuasive.

2.4 Bahrain:

2.4.1 The Country Background

The State of Bahrain Consists of an archipelago of about 33 small islands halfway down the Arabian Gulf, 24 kilometres from the eastern coast of Saudi Arabia, and 28 kilometres from the coast of Qatar, having a total area of 676 square kilometers (Bahrain Profile, 1990).

The last half century has been characterised by the discovery and exploitation of Bahrain's oil resources. The feudal economy, based on pearl fishing, agriculture and trade, has now been translated to an industrial, and service oriented state, with an oil based but increasingly diversified economy. According to 1986 census, the total population of Bahrain was estimated as 411,660.[18] and the esimation of 1991 was 516,444.

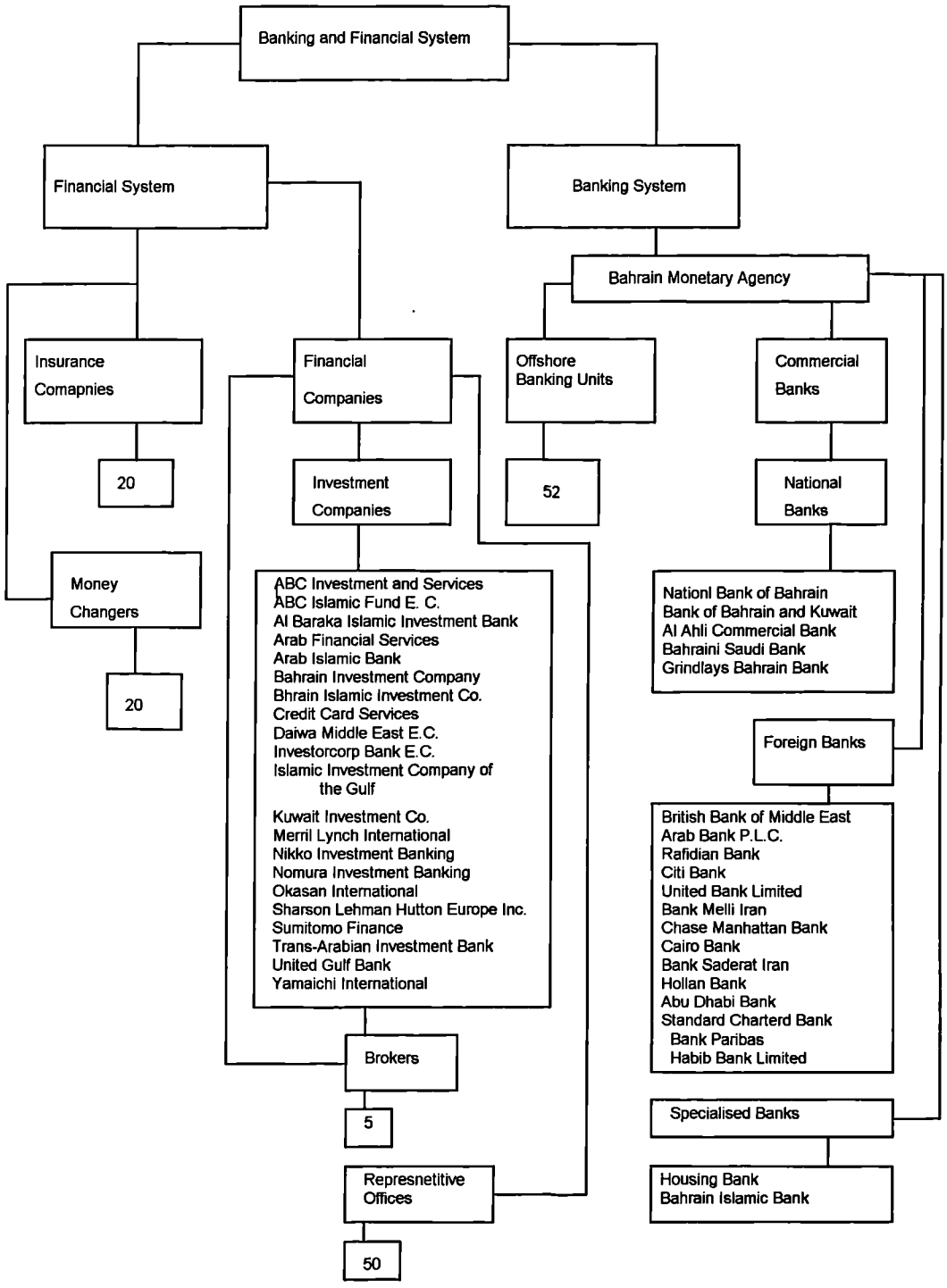
2.4.2 The Financial and Banking Sector:

The Ministry of Finance and National Economy, the Ministry of Commerce and Agriculture and the Monetary Agency are the three major bodies which are in control of the different organisations and institutions of the economy (Bahrain Monetary Agency, 1987).

The Banking Sector:

There was no specific law to regulate the banking activities until 1974. Before that date, the financial department which was directly under the supervision of the ruler, used to generally regulate the banking services according to decision No. 23/1371 in 22-5-1957 which has changed decision No. 13/1956.

Figure No. 2.4: Bahrain Banking and Financial System



In 1920, the Eastern Bank opened its first branch in Bahrain, claiming the privileged position of the banker to the government until 1975, long after the first native bank, the bank of Bahrain was established in 1957.

The Bahrain Currency Board first issued the Bahrain Dinar in 1965 and by 1973 it was replaced by the Bahrain Monetary Agency. After that the Bank of Bahrain and Kuwait and other foreign bank branches were permitted.

The Bahrain Monetary Agency introduced the off-shore banking unit (OBU)[19] licence, after a period of time blocking any new licence for new commercial banks.

Bahrain Monetary Agency:

Established in Manama by Amiri Decree No (23) of 1973, The Bahrain Monetary Agency ("the Agency") is an independent juristic entity, enjoying wide ranging powers as the central monetary institution of the State of Bahrain, and having the usual objectives.

Specialised Banks:

There are two working specialised banks. The first is the housing bank and the second is the Bahrain Islamic Bank, both established in 1979 (Bahrain Monetary Agency, 1987). Their assets are shown as follows:

Table No. 2.14: Total Assets of Specialised Banks

Period	Housing Bank (Million B.D.)	Islamic Bank (Million B.D.)
1987	75.899	73.34
1988	83.948	83.20
1989	91.214	91.71

Source: Bahrain Monetary Agency, Various Issues.

The Housing Bank:

This was established in 1979, with a total capital of 40 BD of which 15 million is paid. It is wholly owned by the government of Bahrain. Its general goal was to oversee the development of construction in the country as expressed in these terms:

1) Provide loans to the Bahrainis to build, extend or repair their own houses.
2) Provide Loans to national organisations to build residential and commercial property.
3) Extend ownership of land (suitable for construction) and of residential or commercial property.
4) Acquire of shares in companies in the construction and construction material industries.
5) Undertake various banking operations relating to the achievement of its objectives.

Bahrain Islamic Bank:

This bank was incorporated by Amiri Decree No. 2 of 1979 as the first Islamic Bank in Bahrain and the third in the Gulf area. Its authorised capital was fixed at BD 23 million (about $ 60.9 million), While the paid up capital amounted to BD 5.75 million ($ 15.2). Its shareholders include public and private institution and individuals from Bahrain, Kuwait, Saudi Arabia and the United Arab Emirates.

The operations of the bank are of considerable interest in the context of the Islamic banking system .

Bidding for funds, Islamic banks are guided by the common principle that depositors, instead of receiving a fixed return in the form of interest, share in the risk of investment with the respective banks and hence split the resulting profits or otherwise bear part of the losses. Similarly, concerning

the use of funds, Islamic Banks cannot charge interest on their loans at pre-determined rates.

They perform their functions on the interest-free principle and undertake certain operations:

A) Mudaraba: Where banks lend funds while clients provide management expertise. The two parties split profits on a pre-determined basis but the respective banks alone bear the losses.

B) Murabaha: Where the respective banks buy commodities and resell them by adding their mark-up as ordinary trading transactions.

C) Musharaka: Where banks and clients jointly contribute capital to projects and share profits and losses.

Off Shore Banking Units.

In September 1975, the Bahrain Monetary Agency announced its plan to develop a centre in the Arab World for dealing in international liquidity. It offered an attractive package to prospective participants.

First and foremost, were the regulatory and fiscal incentives. In particular, OBUs were exempted from maintaining reserves with the Agency or from observing liquidity ratio. No with-holding tax was to be applied to the interest earned by their depositors. No tax was to be paid on their income, and this exemption continues to be effective even now, thereby making Bahrain a tax haven for off shore banking units.

Secondly, the general working and living conditions, with a possible exception of a short-lived scarcity of office and residential accommodation, were satisfactory. Absence of restrictions on private enterprises, freedom from exchange and trade controls and adequate availability of infrastructural facilities, including first-class communications, were also

important factors. The presence of a local population with a natural aptitude and tradition of trading was an additional attraction.

Thirdly, banks and customers gained confidence from the conditions imposed by the Agency to safeguard the country against possible banking abuses.

The highest number of the reported off-shore banking units was 76 in 1984. As a result of the adjustment to the international financial developments the number of the OBU declined to 56[20] at the end of 1989, consisting of 13 locally co-operated banks and 43 branches of foreign banks.

Investment Banks.

In 1977, the Bahrain Monetary Agency passed legislation to organise the Investment Banks and their activities. The aim was to diversify the offered services in the Bahrain financial Market. Conditions needed for the establishment of an investment bank were:

1: A sufficient number of employees for the operation of the banks.

2. A minimum of BD[21] 50.000 for the accepted deposits from other banks either inside or outside of Bahrain.

3. The prohibition of current account service .

4. The offering of loan services to customers outside of Bahrain as long as the loan service does not fall into the category of overdrawn service.

5. A minimum of 25% reserves on the deposit accounts.

6. That the accepted deposits by the bank should not exceed at any time 10 times of the bank capital and reserves.

7. That the investment bank must submit a monthly statistics and annual audited account to Bahrain Monetary Agency.

The number of investment banks reached 17 in 1986, compared to 9 in 1981. However their services are limited compare to the Off-shore Banking Units.

Exempt Companies

As a further step to diversify Bahrain's economy, the government had permitted different categories of companies to become exempt from certain requirements and in particular from all or part of other conditions stipulated in the Commercial Companies law No. 28/1975. These companies are governed by the provisions spelled out in resolution No. 25 of 1977 of the Ministry of Commerce and Agriculture as amended by Ministerial Order No. 5/1979 of June 4, 1979.

Restrictions on making any invitation to the public to subscribe in shares or issuing debentures were relaxed under Decree no. 23 of 1981. Except with the express consent of the Ministry of Commerce and Agriculture, an exempt company is not allowed to conduct any business or undertake any commercial activity within Bahrain. Normally, therefore, it is required to operate off-shore. It must maintain an office in Bahrain and as such direct its affairs from Bahrain.

Another requirement that must be met by exempt companies is that their minimum capital has to be BD 20.000 but in the event of being given permission to engage in insurance, or banking or investment, the capital requirement is determined on the merits of each case.

Insurance:

At the end of 1989, the insurance sector in Bahrain covered three broad categories. The first category consists of the 8 Bahraini companies. The second category comprises 15 foreign insurance companies which have been allowed to establish branches in Bahrain. Finally, there are 38 exempt companies permitted to conduct insurance business offshore[22].

Social Insurance and Pension Fund:
General Organisation for Social Insurance.

The Amiri Decree No. 24 of June 29, 1976 formulated the social insurance law. The organisation has board comprised of 15 including the chairman who will be the Minister of Labour and Social Affairs. It has an independent budget and the administration expenses are not to exceed a certain amount of the annual contributions. The social insurance scheme is to provide:

1: Insurance against old age, disability and death.

2: Insurance against employment injuries.

3: Family allowances for pensioners and their beneficiaries.

The social insurance scheme is compulsory to all Bahraini and non Bahraini workers regardless of their sex or age, with the exception of civil and military services of the government.

The organisation invests the surplus money in such a way as to secure the highest possible return in order to meet present and future obligations.

Pension Fund.

All Government employees classified by grade in the state municipal budget are eligible for a pension under the pension scheme established in terms of the law No. 13 1975.

After finishing fifteen years of service, the employee is entitled to a pension equivalent to a maximum of two thirds of their last basic salary and to a minimum of BD 30 per month.

The Amiri Decree law No. 16 of 1982 gave extra benefits to government employees on their retirement. The law made it possible for those who reached retirement age with no entitlement to a pension to extend their service to 65 years.

The contribution of the government and employees to the pension fund respectively 14% and 7% of the annual basic salary of the employees. The fund has an independent budget managed by the pension fund and the scheme is headed by the Minister of Finance and National Economy.

2.4.3 Development and the Structure of the Bahraini Market

The Beginning Stage:

The National Bank of Bahrain was the first to be established in 1957 with a paid capital of 125.000 BD. The success of the national bank had led to the establishment of more public companies as in table No. 2.17:

The establishment of these companies in different sectors was to follow the economic and social development that occurred after independence in 1971 and the oil production boom. A further step was being taken by the government of Bahrain to diversify the economy and not to be dependant

on the oil sector, to turn Bahrain into a financial centre allowing off-shore banks to operate in Bahrain.

Table: 2.15: First Establishing Companies

National Bank of Bahrain	1957
Ship Repairs	1962
Bahrain Cinema	1967
Bahrain Hotels	1967
Bahrain Insurance	1969
Bank of Bahrain & Kuwait	1971

The period from 1979 to 1983 was regarded as an important period in the forming of new companies. First, the forming of four companies was announced in the period 1980-1981. The Bahrain Telecommunication company was amongst them, while two of the four companies failed to attract subscription. Second, this period saw the emergence of what is called the Gulf Companies. As was mentioned earlier, the ban on new companies in Kuwait by the ministry of commerce in 1977 caused Kuwaiti investors to search for a place in the Gulf to establish new companies. Bahrain legislation allows new companies provided that these companies do not conduct any business in Bahrain. Seventy eight new companies were to be established by 1981 which had an effect on the secondary market.

The secondary market was developed during this period. Share trading become active due to; the banks' involvement by way of offering credit facilities, the general fall of interest rates around the world and the use of post dated cheques[23] The use of post dated cheques followed the style used in the unofficial stock market in Kuwait.

A place called Al-Jawhra witnessed an expansion of more new brokers' offices and active share trading. The prices of the shares traded started to escalate to higher levels and were related to speculation rather than to the performance of these companies. The market boom was mainly related to the speculation in Souq Al-Manakh in Kuwait (unofficial market). Therefore, when the crises happened in Souq Al-Manakh in August 1982, it was followed by a collapse in Souq Al-Jawhrah in Bahrain while the other contributing reasons were; the failure of investors to pay post-dated cheques (Bahraini and Kuwaiti), a lack of rules governing share trading, and the Iran-Iraq War[24].

The steep fall of shares prices was followed by a recession. To encourage the revival of the equity market, the Ministry of Commerce and Agriculture established an information centre in 1984 which allowed shares data to be rapidly processed. Also, some restrictions were also imposed on trading and broking which was the beginning of the return of confidence in the market.

The Second Stage:

The first formal Stock Exchange was established in 1984 with 32 listed companies, of which 19 were local ones and 13 were exempt.

The State set up a new stocks and shares information centre at the Commerce Ministry. Consequently, there are 19 dealers registered in the Ministry, and investment companies are trying hard to assume the same function and trade on the market. Brokers are required to work within the guidelines of the brokerage regulations passed in 1982 and they also must provide the Ministry with information on all transaction.

Official Stock Market.

The Ministry of Commerce and Agriculture chaired a committee to study the crisis and provide a solution. The committee approached, the International Finance Company to conduct a feasibility study for establishing a stock exchange in Bahrain. A recommendation by the IFC supported the forming of a stock exchange to avoid future crisis and complement the other financial services in Bahrain.

Legislative Decree No. 4 of 1987 created the stock exchange as a separate legal entity and provided a legal framework for more details to be added. Published in the Gazette on March 5 , 1987, and effective from that date, The Decree provides close supervision and regulation of the exchange by an appointed statutory authority, the Security Exchange Council. It provides that only securities issued by Bahraini companies will be traded initially, followed by an extension to companies from GCC states, and eventually with the admission of international companies.

The stock market started to operat on 7 June 1989. The securities traded as stated on the Exchange's law. First, Shares of Bahraini Public Companies. Second, Shares of approved Non-Bahraini Companies. Third, Debt Debentures and any other instrument agreed by the board of directors of the stock exchange.

The following table gives a list of the traded companies on the stock market of Kuwait:

Table 2.16: Traded Companies at Bahrain Stock Market

Name of the Company	No. of Shares	Nominal Value
National Bank of Bahrain	28,000,000	BD1
Bank of Bahrain & Kuwait	55,000,000	BD1
Al-Ahli Commercial Bank	8,000,000	BD1
Bahrain Islamic Bank	5,750,000	BD1
Bahrain Saudi Bank	20,000,000	BD1
Arab Banking Corporation	100,000,000	$10
United Gulf Bank	800,000,000	$0.25
Bahrain International Bank	719,604,000	$0.25
Investorcorp Bank	400,000,000	$0.25
Bahrain & Middle east Bank	559,774,556	$0.25
Bahrain Insurance Co.	1,200,000	BD1
Bahrain Kuwait Insurance Co.	1,200,000	BD1
Al-Ahli Insurance Co.	1,000,000	BD1
Union Gulf Insurance Co.	57,240,000	$0.25
Bahrain Ship Repairs Co.	800,000	BD1.
Bahrain Cinema Company	1,259,880	BD1
National Import & Export	6,000,000	BD1
General Trading & Food Co.	2,500,000	BD1
Bahrain Martime & Mercan	5,400,000	BD1
Bahrain Tele. Co.	60,000,000	BD1

Bahrain Car Park Co.	7,031,723	BD1
Bahrain Floor Mill Co.	2,150,000	BD1
Bahrain Light Indust. Co.	1,250,000	BD1
Delmon Poultry Co.	2,974,048	BD1
Bahrain Hotels Co.	8,484,480	BD1
National Hotels Co.	14,441,785	BD1
Bahrain Tourism Co.	7,200,000	BD1

Source: Bahrain Stock Market, Annual Report, Various Issues.

The stock exchange is a separate legal entity with revenues coming from members' fees, services offered, by the stock exchange and any other services approved by the board of directors. The exchange has a board of directors chaired by the Minster of Commerce and Agricultural. The board also includes one member from the Ministry of Finance and National Economy, one member representing Bahrain Monetary Agency, three members elected by the Chamber of Commerce representing the private sector, and two members representing the National Banks and Auditing firms.

Table 2.17: Annual Statistics of the Bahrain Market.

Period	No. of Transaction	Shares Traded Value (BD)	Share Traded Volume
1989	2,079	14,342,129	61,282,888
1990	3,258	33,671,557	98,466,653
1991	4,224	39,535,390	78,286,888

Source: Bahrain Stock Exchange, (1990), Annual Report.
Central Statistics Organisation, (1992), Statistical Abstract.

There are two type of brokers and market makers: natural and artificial as stated by stock exchange law. *Natural* refers to person while *artificial*

refers to an institution. Brokers are those who sell or buy shares on behalf of their clients. Market makers are those who deal in shares pertaining to their own accounts. The capital requirement for the artificial brokers is B.D. 30.000, whereas the market makers is B.D. 100.000 for natural and B.D. 200.000 for artificial.

The market operates in a single capacity system which means there can only be brokers or market makers. To date, despite the law giving the permission no one has operated as a market makers. A minimum of one Bahraini Dinar is applied to any transaction (Al-Alaiwat, 1990). There is a fixed rate commission charged to clients as follows:

1) 0.25% if the value transaction is up to B.D. 10.000.

2) 1.25% if the value of the transaction is more than B.D. 10.000.

The traded companies are classified into two groups by the Exchange's law[25]. First, listed Companies and Second Unlisted Companies. There are certain certain conditions that must be met before the shares of the company are traded in the market.

a) A minimum of BD 500.000 paid of capital with at least 500.000 shares 50% of the share values must have initially to be paid . Also, two consecutive audited balance sheets must have been issued.

b) The market value of the share shall not fall below the value of the share's nominal value.

c) The annual sales shall not be less than B.D. 500.000.

d) A profit must have been achieved over last two years.

e) The company's total assets shall not be more than 20% of its total capital.

f) The financial position of the company should be sound in terms of its assets, cash flow, stability of financial structure and effective performance.

g) The company balance sheet should be published in a daily newspapers.

When it comes to the conditions for the unlisted companies they are relaxed in comparision to those of listed companies. Only the last two conditions are required to be maintained.

The Exchange working hours are from 8.00 a.m. to 4.00 p.m. except Friday and Saturday and the trading floor hours are from 9.30 to 11.00 and from 4.00 to 6.00. The Exchange is linked to Reuters so that investors from outside of Bahrain can easily follow the market's movements.

The stock exchange follow operates with an auction system similar to the Kuwait Stock Exchange System . There are two display boards , the first is to display the transaction and it is divided into different areas, each designated to one company. The area is also divided into an upper part and a lower part. The upper part shows the company name, last closing price and date, unit value (the monetary value by which share prices fall or rise), and the trading unit (minimum traded quantity; the number of shares determined by the market price of the company share and estimated lump sum). The lower part of the area shows selling and buying orders for that

company together with member name and required price. The second board is designated for orders (Al-Alaiwat, 1990).

A number of steps are required to end the transaction. The broker receives the selling or buying order from his clients. After checking that, he will list the order in his book which is then sent to the broker's representative on the trading floor. The order of shares of company is placed on the designated section of the board. After a matching between the bid and the offer price , a contract will be drawn up between the buyer and the seller. Reuters will be updated to reflect the transaction. The clearing process should not take more than three days from the drawing the contract on the trading floor. The final step is the payment made by the payer before receiving with an ownership card or the share certificate.

A screen is also available for the investors which shows the activities in the dealing room. The stock market also publishes information daily, weekly, semi-annually and annually on the dealings and transaction volumes. Also, a descriptive financial analysis is done by the stock market itself for all the companies on the market.

In summary Bahrain has some of the same history in its development as the Kuwait, Saudi markets, recent growth, government establishment, but is less lightly regulated than the Saudi market.

2.5 Oman

2.5.1 The Country Background:

Oman lies on the south eastern part of the Arabian peninsula, a coast line that extends for 1,700 kilometres. Its total area is 300,000 square kilometres of very varied, striking terrain (Oman 92).

Dominated by an interior of jagged mountains simply called A-Hajr, (the rock), the country is a tapestry of different terrains. The mountains rise straight out of the coastal plains and the sea, or from of the gravel plateaux and shifting dunes in the interior. The highest peak soar to 3,075 meters, is the terraced Jabal Al-Akhdar (the green mountain) ,

The country ranges from the fjord-like barren majesty of the Musandam Peninsula that plunges into the Strait of Hormoizin the north, to the fertile Batinah Plain that inclines south-east toward Muscat; from the vast, sandy edge of the Rub' Al-khali (the empty quarter) through the mountains to the lush, monsoon-based near-tropical salalah plain in the South.

To the west Oman borders Saudi Arabia and the United Arab Emirates; to the South, Yemen; to the North the Strait Hormuz; and to the East the Arabian sea.[26]

The oil was first discovered in commercial quantities in the Sultanate of Oman in 1964, and went into production in 1967. More discoveries of oil field by the middle of seventies associated with increasing of the oil production which change the economy to be an oil one. Furthermore, it had effect on the nature of developmental plans of the country.

According to the Ministry of Information Statistics of 1992, the population is estimated at 2 million.

2.5.2 The Financial & Banking Sector:

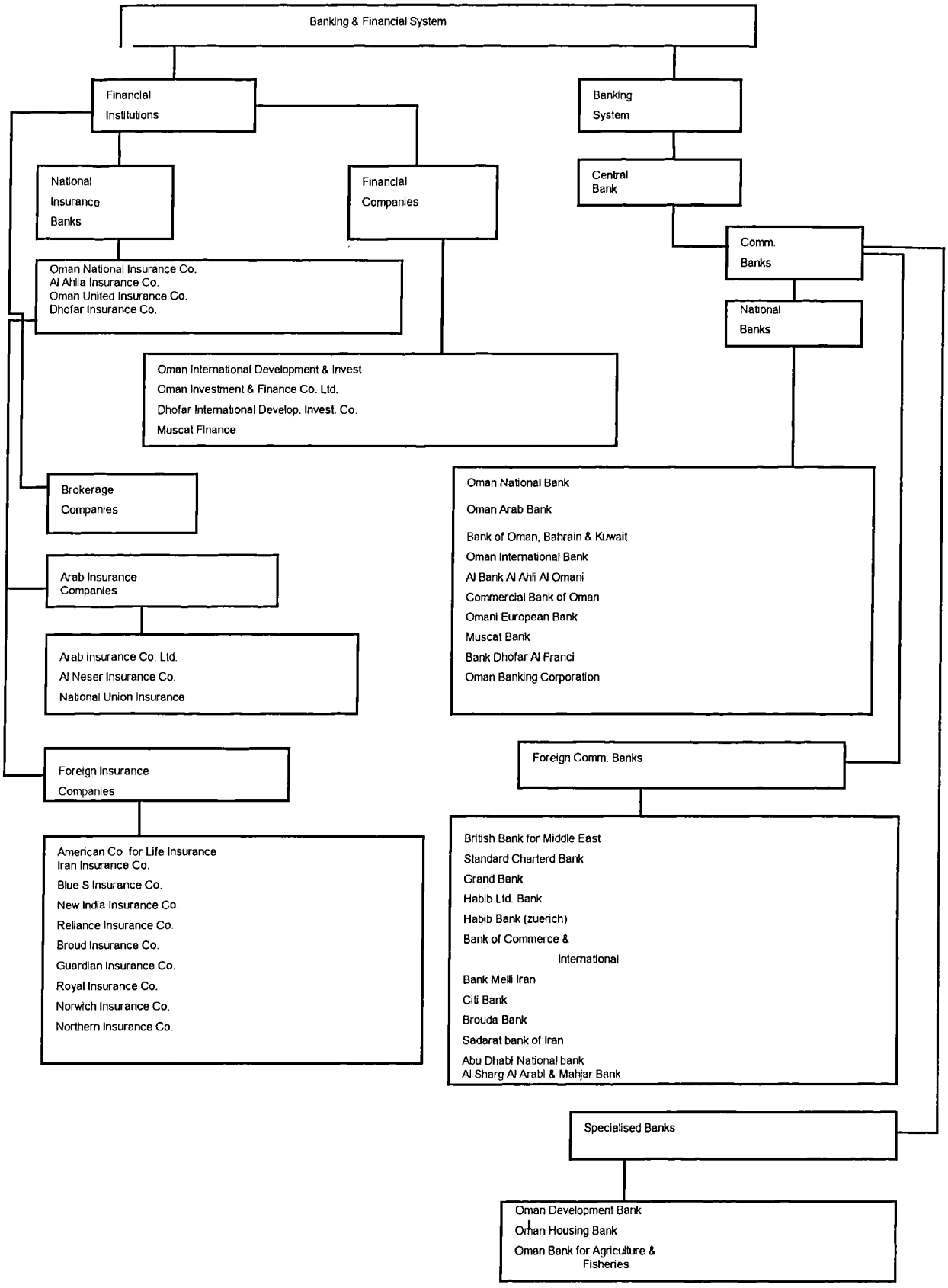
The Ministry of Finance and the Ministry of Commerce are the main bodies in charge of the financial and banking sectors.

Banking Sector:

The British overseas banks were dominating the banking sector of Oman until 1960 when other foreign banks moved into Oman. In May 1970 a national currency was issued, the Saudi Riyal, replacing the Indian Gulf rupee. The new currency was backed totally with gold and foreign gold convertible currencies. The Muscat monetary Authority was also established as the country's monetary authority. Its objectives were to control the new currency and to manage the foreign reserve used as the currency's cover. The British Bank of the Middle East supplied technical management of the new currency. In November 1972, a new currency was issued, the Omani Riyal, equal in value to the Saudi Riyal. A new monetary authority was established, the Omani Currency Board. Finally, on December 1974, The Omani Central Bank was established, taking over all the Currency Board's assets and Liabilities.

The Chartered Bank and Grindlays joined the British Bank for the Middle East. Other arriving banks were: The Arab Bank, Habib Bank, Sedrat Iran and Bank Melli. When Sultan Qaboos ruled the country, there was an influx of Multinational Banks : The Citi Bank and also Arab Banks: The National Bank of Abu Dhabi and the Bank of Credit and Commerce with 12 branches. The National Bank of Oman established in 1973 was followed by the Bank of Oman and the Gulf, Bank of Oman, Bahrain and

Figure No. 2.5: Oman Banking and Financial System



Kuwait, the Commercial Bank of Oman, The Oman Arab African Bank and the Union bank of Oman.

The specialised banks are the Housing Bank (1977), Development Bank (1976) and Agricultural Bank (1981). Their activities respectively are; promoting loans for private housing, promoting loans for industrial projects and promoting loans for agricultural and fishing activities and projects.

2.5.3 Development and the Structure of the Omani Equity Market

This section provides an introduction to the development of an equity market that is a relatively new. We will explain the start of the informal market to the establishment stage of the organised market (Muscat Securities Market).

Because of the lack of specialised legislation the market stayed disorganised until 1989, even though there was legislation with regards to both economic and financial matters.

The Initial Stage:

The first established share holding company was the Oman Hotels Corporation in 1971. That was followed by the establishment of several companies to a total of 71 before the opening of Oman Securities market in 1989. The companies were: 32 closed, and 48 share holding. This gave an ownership equity of 269,9 Omani Million Riyal and 17,000 share holders.

Table 2.18: First Established Omani Companies

Name	Date of Establishment
Oman Hotels Corporation	1971
Oman National Bank	1973

Source: Muscat Securities Market, (1992), Muscat Securities Mark*et, May.*

The trading of shares in that period was fragmented because the market was still disorganised. That had adversely affected fair prices and this usually at the cost of the customers. Trading occurred through just few merchants who were neither prepared nor qualified to conduct the trade , this had the following effects:

1) Prices were control by a number of brokers and few speculators.

2) Lack of investment information about the traded shares.

3) The acute changes in prices without rational cause.

4) The use of inside information.

5) A thin and illiquid market.

1983-1984, the Omani Government funded a number of studies to provide effective proposals for establishing an organised securities market. Those studies were conducted by Arabic and international organisations that recommended the establishment of a Securities Market while drawing on the successful experiences of developing countries in particular.

Believing in the development of the national economy, the Government sought the International Finance Corporation for feasibility Study for establishing the Securities Market. The IFC gave two pieces of advice.

The first was to gradually establish the Securities Market and the second was concerned with the altering of some articles on Commercial Companies' law No. 4/1974.

Second Stage:

On 21 June 1988, a Sultanate Decree was issued to announce the Securities Law which provided a framework for the establishment of the Oman Securities market and its structure. It was followed by the internal market law.

Oman Securities Market:

The official opening of the Securities Market was on 20 May 1989. The first trading deal was on instruction from the Sultan of Oman to buy the shares of the traded companies in the interests of charitable societies.

The Oman Securities Market is an authority that organises and directs the issuing and trading of securities (on the primary and secondary markets). It also executes the following tasks:

1) Close direction on the trading process to make sure there is a fair price for the listed companies.
2) Supervision over the share holder's departments on the listed companies over the transferring of shares ownership.
3) Supervision over the listed brokerage companies.

Trading is limited inside the market and there are three markets-the official market , the parallel market , and the third market. Each has a different listing requirements. The trading is conducted through a written auction system with trading sessions for the official market on the morning from

Saturday to Wednesday and in the evening on Monday and Tuesday. Below are the listing requirements:

1) The listed company has to be a share holding company.

2) The subscribed capital has to be at least 500,000 Omani Riyals.

3) The company has to be already registered on the commercial record of the Ministry of Commerce.

4) A minimum of one year profit must be achieved before listing.

5) Certain requirements for ownership have to be maintained such as:

   a) A minimum of 50 share holders.

   b) A minimum of 20 share holders from the small investor's category (who own 1-2000 shares).

   c) 5% of the shares has to be subscribed by to small investors.

6) A minimum of a one year listing period on the parallel market should be introduced and adhered to, with 2% of the subscribed shares traded during that period.

7) The annual report of any listed company has to be published in at least two daily newspapers.

8) The board of directors of the Oman Securities Market has the right to exempt any company from the above requirements.

The trading hours of the morning sessions of the market are from 10 to 12 from Saturday to Wednesday the afternoon sessions are from 4-6 on Sunday and Tuesday. The buyer or the seller has to fill out a written order available to the authorised brokers. The broker is to act on the behalf of the customer on the trading hall. Once the deal is executed the customer is to be informed.

Table 2.19: Omani Traded Companies

Name of the company	No. of shares	Date of Establishment
Oman Flour Mills	10,500,000	1976
Raysut Cement Co.	8,000,000	1981
Dhofar Cattle feed Co.	4,562,500	1981
Packing Co. Ltd.	500,000	1986
Oman Textile Co.	6,000,000	1988
Oman National Dairy	750,000	1976
Oman Refreshment Co. Ltd.	1,200,000	1974
Oman Detergents Co. Ltd.	900,000	1981
Areej Vegetable Oils Co.	2,300,000	1980
Construction Mater. Build.	6,000,000	1977
Oman Organic Fertiliser & Chemical Ind.	N.A.	N.A.
Oman Cable Industry	100,000	1984
National Mineral Water	800,000	1979
National Biscuit Industries	450,000	1982
Dhofar Beverages Co.	612,000	1978
Al Batna Corporate Dairy	500,000	1983
National Aluminium Products	3,357,145	1984
Reem Batteries & Power Appliances Co.	1,350,000	1981
Al-Amal Industries	650,000	1987
National Beverages	562,500	1974

Oman Water Pump MFG	228,950	1984
Commercial Bank of Oman	5,000,000	1975
Oman Consolidated Bank	N.A.	N.A.
Oman Consolidated Bank (2)	N.A.	N.A.
National Bank of Oman	18,000,000	1973
Oman Banking Corporation	6,000,000	1978
Al Bank Al Ahli Al Omani	5,000,000	1976
Bank of Oman, Bahrain & Kuwait	15,000,000	1973
Oman International Bank	10,000,000	1978
Oman Development Bank	10,000,000	1976
Oman Investment & Finance Co Ltd	2,500,000	1980
Oman International Develop & Invest Co.	16,000,000	1983
Dhofar International Develop & Invest Co.	10,000,000	1987
Financial Services Co.	2,000,000	1989
Al Ahlia Portfolio Securities Co.	3,000,000	1989
Oman National Insurance Co.	5,000,000	1978
Al Ahlia Insurance Co.	2,000,000	1985
Oman United Insurance Co.	2,000,000	1985
Dhofar Insurance Co.	6,000,000	1989
Gulf Hotels Co.	2,000,000	1975

Al-Khuwair Develop & Serv Co.	1,000,000	N.A.
Oman Hotels Co. Ltd.	3,000,000	1971
Dhofar for Trade & Industry	N.A.	N.A.
Al Ahlia for Finance	2,000,000	1978
Al Jabal Al Akhdar for Trade & Cont. Co.		1985
Modern Poultry Farms Co.	1,500,000	1987
Port Services Corporation	4,800,000	1977
Oman Aviation Services Co.	7,000,000	1981
Sohar Poultry Co.	N.A.	N.A.
Oman National Electric Co.	1,000,000	1978
National Gas	1,000,000	1978
Oman Fisheries Co.	2,500,000	1987

The officials have shown to be promoted the market and the activity of the market can be seen from the following table.

Table 2.20: Oman Securities Market Statistics

Year	Volume of Traded Shares	Value of Traded Shares	No. of Contracts	No. of Firms	Market Capit.*
1990	24,610477	48,190,649	13054	50	489,7
1991	23,343,525	55,566,895	13754	41	579,1

**Capit. = Capitalisation*

Source: Muscat Securities Market, (1991), Annual Report
Muscat Securities Market, (1992), Omani Share holding companies Guide, Vo. 4.

2.6 Comparisons and Conclusion

Comparisons between these markets can be summarised as follows: first the developmental stages; second the ownership of these markets; and third is the structure.

Regarding the stages of development of all four markets have followed similar but not totally identical paths. Initially, a few companies were established according to the needs of that period. The big change is when the production of oil in large volumes increased the oil revenues. This had a direct effect on government plans for each country's development and as a consequence more companies are established to serve the developmental stage. Third, the need to set out and to regulate the equity market for the purpose of channelling saving towards the most appropriate investment opportunities has been a constant feature.

Governments of the four Gulf states own and operate these equity markets. The supervision of these four markets is through members of the council or members of the board. Members of both the council or the board are appointed by the government. These markets enjoy separate legal identities, except in Saudi Arabia where the market is operated by share control department at Saudi Arabia Monetary Agency. A central trading place is available for the equity market of Kuwait, Bahrain and Muscat. Saudi Arabia is different because the trading is conducted through the automated trading system of brokers of commercial banks units in Saudi Arabia.

The internal structure is divided into different areas as follows: *the market membership, type of the market, orders, trading and transaction costs* (see

table No. 23) Membership mainly constitutes listed companies and permitted broker companies in the official markets of Kuwait, Bahrain and Oman. Satisfactory conditions set by SAMA has to be met by applying companies that are seeking to be publicly traded in the Saudi equity market and permission of brokerage is only given to the commercial banks through their trading units' (when the field trip to Saudi Arabia conducted, it was noticed that a substantial amount of trading is done through unlicensed brokers offices mainly in the city of Riyadh and Jeddah). Companies which meet the admission's requirements are listed in the official markets in Kuwait, Bahrain and Muscat and there are parallel markets (Unofficial or Secondary Market) for companies which do not meet the criteria set by these three official stock markets. There is also a third market in Muscat Securities Market for companies that do not meet the criteria set for the official market or the Secondary market.

Table No. 2.21: The Organisation and Structure of the Gulf Equity Markets

Country	Kuwait	Saudi Arabia	Bahrain	Oman
Main Equity Markets	Kuwait	Riyadh	Manama	Muscat
Organisation				
Ownership	Public	Public	Public	Public
Regulation	Government	Government	Government	Government
Supervisory Body	Council of The Stock Market	Member of the Board: Ministry of Finance, Saudi Monetary Agency, and Ministry of Commerce	Council of the Stock market	Council of the Stock market
Membership				
Brokers	Yes	Through The Commercial Banks Units	Yes	Yes
Dealers	Yes	No.	Yes	Yes
Banks	No	Yes	No	No
Markets				
Spot Market	Yes	Yes	Yes	Yes
Forward Market	Yes	Prohibited	No	No
Settlement Period	Biweekly	Biweekly	Biweekly	weekly

Option Market	No	No	No	Yes
Second Market (Unofficial or Parallel Market)	Yes	No	Yes	No
Third market	No	No	No	Yes
Orders				
Market Order	Yes	Yes	Yes	Yes
Limit Order	Yes	Yes	Yes	Yes
Price Determination				
Periodic Call Auction	Yes	Yes	Yes	Yes
Continuous Auction Market	No	No	No	No
Primarily Dealer Market				
Trading Hours				
Trading Hours	10-12 P.M. and 4-6 P.M.	10-12 P.M. and 4-6 P.M.	9.30-11 A.M. and 4-6 P.M.	10-11.30 A.M. and 4-6 P.M. only on Monday and Tuesday.
Trading Days	Saturday -Wednesday	Saturday -Wednesday	Sunday-Thursday	Saturday -Wednesday
Transaction Costs				
Brokers Fee	Based on classification	Based on classification	Based on classification	Based on classification

Trading of shares is done mainly in the spot market, whereas trading in the forward market is prohibited in Saudi Arabia and is very limited in the other three markets, and in addition, there is a lack of proper market making. Official brokers take orders with a fixed commission (based on different classifications of share prices) in the four markets[27] with a stamp duty fees paid to the market. The ordinary share is the main investment instrument on the market and also market and limited orders are the dominantly two orders of share trading.

The trading system operating in the Saudi Equity Market is an automated system which matches the orders of sellers with buyers; written auction trading systems are conducted in the other three markets. Settlement is usually done inside the market either directly through the market administration or through other clearing bodies who work in the stock market, such as the Saudi Registration Company or Kuwait Clearing Company. The settlement process is carried out either weekly or semi-weekly on the four markets.

Recent performance of the four markets as in table No. 2.22 : shows the value of share traded in: Saudi Arabia (SR 13,698,831,754/US $ 3,662,789.236), Kuwait (KD 502,029,000/US 1673,430,000), Bahrain (33,671,557/US $ 3,367,368) and Muscat (OR 53,580,199/US $ 139,169,348).The volume of traded shares shown in table No. 2.22 are to follow; 35199907 in the Saudi market, 1612917389 in the Kuwait market, 78126328 in the Bahraini market and 21921833 in the Omani market. We can see the value and the volume of the traded shares are the highest in the Kuwait market.

There is a maximum price change of 10% per trading session (1/2 a day) on the four Gulf Markets which is regarded as a suitable method for overcoming speculation and making the market's prices stable and usually further action is taken by the authorities in case of these limits are exceeded (e.g. stop the trading). In comparison to UK and NYSE markets a consequence of market makers own trading and stock holding activities is that they act to maintain continuity of prices and stabilise markets activities which means limiting any fluctuation in the price of any stock they handle (see table No. 2.25). Trading of shares presently is done on Saturday to Wednesday of the week, Bahrain market on the other hand share trading is from Sunday to Thursday.

Again in reference to table No. 2.22 and No. 2.23, we can see that Gulf Equity Markets are small in their market capitalisation by comparison to other world equity markets. For example, Saudi Arabia with the largest market capitalisation is $ 40 bn by the end of 1992 (around $51 bn at the end of 1993) and that is only comparable to Italy with $ 65 bn.[28]. The other three market have a lower market capitalisation and they are as shown in table 2.22: Kuwait with $12 bn before the market closed in August 1990 (around $10 bn by 1993), Bahrain is $4.4 in 1992 (around $5.6 by the and of 1993) and finally Oman with around $ 1.2 bn in 1992 (around $ 1.6 bn in 1993.

We also find a low number of listed companies, low volume of trading and a small number of contracts in comparison to other developed markets. With regard to the number of companies at the end of 1992 and 1993, they are as follow; 60 and 66 in the Saudi market, 54 and 47 in the Kuwaiti market (the number 54 is before the closure of the market in August 1990), 29 and 33 in the Bahraini Market, 43 and 39 in the Omani Market

(these numbers are excluding the traded companies in the Omani secondary market which are at present 23). Another example, we find that the value of traded shares in the London Stock Exchange is £325579520.0[29]- large in comparison with the value of the traded shares in the Gulf Markets.

The chapter gave a brief introduction of each financial system of each the four studied countries and then it described the evolvement of share trading to the establishment of stock markets. At the end of the chapter a comparison was given between the Gulf Equity markets and a brief comparison with other World equity markets.

The special history, and special regulations suggest that the Gulf markets are likely to be different from other equity markets. To what extent are they different from each other and the barriers to closer harmonisation, cooperation and integration are the subject of chapter IV. In the next chapter we consider the properties of stock markets established in previous literature.

Table No. 2.22 : Aggregate Statistics of the Gulf Equity Markets

Country	Stock Market	No. of Firms until the End of Period Included for the Study for Each market	No. of Firms at the Beginning of 1994	Value of Traded Shares	Volume of Traded Shares until the End of Period Included for the Study for Each market	No. of Contracts until the End of Period Included for the Study for Each market	Market Capitalisation until the End of the Period Included for Each Market	Market Capitalisation until the Beginning of 1994
Saudi Arabia	Saudi Arabia	60	66	13,698,831,745	35,199,907	272,075	$ 40 bn	$ 51 bn
Kuwait	Kuwait	53	47	502,029,000	1,612,971,398	33506	$ 12 bn	$ 10.1 bn
Bahrain	Bahrain	28	33	39,535,390	78,126,326	4,224	4.4 bn	$ 5.6 bn
Oman	Muscat	42	39	53,580,199	21,921,833	13,005	1.193 bn	$ 1.6 bn

*Value of share trading are based on local currencies.
* Number of firms available here does not include the traded companies at the parallel market.
Source: Euromoney (May 1993) World Equity Markets.
Kuwait Stock Market, Annual Report 1992
Kuwait Stock Market, Annual Report 1993
Bahrain Stock Market, Annual Report 1990
Muscat Stock Market, Annual Report 1992
Saudi Monetary Agency, Annual Report 1992
Middle East Newspaper, Capital Markets, 11 May 1994, p. 13.

Table No. 2.23 : Comparison of Market Capitalisation of World Equity Markets.

Country	Market Capitalisation ($ bn)
Switzerland	135.2
UK	580.9
Germany	221.8
France	218.3
Netherlands	105.9
Italy	65.0
US	2382.9
Japan	1369.5
Saudi Arabia	51
Kuwait	10.1
Bahrain	5.6
Oman	1.6

Source: Euromoney, World Equity Markets (May 1993).
Authors's Research

Table No. 2.24 : Trading Systems and Stabilisation of the US, UK and The Gulf

Trading System		
	Call	Continuous
NYSE		Y
London		Y
Kuwait	Y	
Saudi Arabia	Y	
Bahrain	Y	
Muscat	Y	
Stabilisation		
	Max. price change limit	Official Market Maker
NYSE	N	AO*
London	N	Y
Kuwait	Y	Y
Saudi Arabia	Y	N
Bahrain	Y	N
Muscat	Y	N

** Affirmative Obligation*
*Source: Cohen, K. J., S. F. Maier, R. A. Schwartz and D. K. Whitcomb, (1986),*The Microstructure of Securities Markets, *Prentice-Hall, Englewood Cliffs, New Jersey, 32-37.*
Author's Research

Notes of Chapter 2

[1] Gulf Cooperation Council for the Arab States of The Gulf, (1992), "The Unified Economic Agreement" G.C.C Printing Press, Riyadh.
[2] Gulf Cooperation Council for the Arab States of The Gulf, (1992), "The Unified Economic Agreement" G.C.C Printing Press, Riyadh.
[3] Gulf Cooperation Council for the Arab States of The Gulf, (1992), "The Unified Economic Agreement" G.C.C Printing Press, Riyadh
[4]Ministry of Planning:Centeral Statistical Office, (1990), *Statistical Review*
[5] Ministry of Planning:Central Statistical Office,(1990), *Statistical Review.*
[6] Bahrain Central Statistics Organisation, (1992), Directorate of Statistics, (December).
[7] El-Beblawi, H.(1984), "Kuwait Stock Market', p376.
[8] El-Beblawi,H. op. cit.
[9] El-Beblawi, H. op. cit.
[10] The name Al manakh is an old name meaning "a place to rest the camels". Now, there is a modern building there ,known as Souk Al Manakh, for selling and buying the shares of Gulf Companies.
[11] Companies Established in the Gulf Neighbouring States.
[12] Its shares is not available to public
[13] Its shares are not available to the public.
[14] The author tried through several channels to an official statistics about the ownership of differnt sectors on the market icluding the goverment quata but he could not.
[15] Since the re-openning of the stock exchange in September 1992 there has been several debates of how the government should sell its shares to the private sector and further privatise some of the fully government owned companies.
[16] Saudi Ministry of Information 1990
[17] Following the Hijra Calendar
[18] Ministry of Information (1989), "Bahrain Profile", Government Press, Bahrain
[19] OBU: Offshore Banking Units.
[20] Bahrain Monetary Agency, Annual Report 1990.
[21] Bahraini Dinar.
[22] See Table (3).
[23] Cheques paid with a premium on the date of maturity.
[24] The market was sensitive to the war's developments and the threat that might be extended to the Arabian Gulf Neighbouring States.
[25] See Table (4) for the Traded Companies on the Bahrain Stock Exchange.
[26] Ministry of Information, "Oman'92"
[27] In Saudi Arabia, brokers in commercial banks units are the only ones who can take selling and buying orders.
[28] See appendix No.2.2
[29] 1992 Annual figures (Data Stream)

Chapter III: Capital Market Efficiency

3.1 Introduction:

The finance literature on offer shows that the efficient market term means that the security prices fully reflect all available information. The Efficient Market Hypothesis has been tested as an explanatory model for price behaviour in different markets: Foreign Exchange, Commodity and Stock Market. In comparison with all the material available for the large and advanced markets, little research has been done in developing markets.

Empirical tests of market efficiency have improved the understanding of the developed stock markets during the last 20 years and the case of its application to the developing markets has started to grow, which gives an opportunity to explore the share prices behaviour and the functioning of these markets. Fama stressed the importance of the tests of market efficiency in the following [1991. p. 1576];

> " ...judged on how it has improved our understanding of the behaviour of security returns, the past research on market efficiency is among the most successful in empirical economics, with good prospects to remain in the future"

The main investigation of this study is to test for (a) weak form efficiency (predictability of returns), (b) anomalies related to weak form efficiency (day-of-the week effect), (c) transaction costs (bid-ask spread) as it is related to efficient market. Thus, this chapter is to provide the theory underlying the capital market efficiency focusing on the above issues and reviewing the relevant empirical work.

The chapter is divided into ten sections. The first is the introduction. The second gives a background and definition of the market efficiency. Third, is the debate of market efficiency definition. Fourth, anomalies of market efficiency day-of-the week effect). Fifth, role of the transaction costs in the efficient market. Sixth, Significance of market efficiency. Seventh, evidence of weak-form of market efficiency. Eighth, evidence of semi-strong form and strong form of market efficiency. Ninth, is an explanation of the efficiency testing problems. Tenth is the conclusion of the chapter.

3.2 Background and the Definition of Market Efficiency:

The accumulation of empirical literature in the mid 1950's and early 1960's provided the evidence that common stock behaviour and other speculative prices could be well approximated by a random walk (Fama 1970) has resulted in the developing of the market efficiency theory.

Bachelier (1900) was the first to examine speculative prices in a competitive market to find that the commodity prices on the French Bourse followed a random walk.

Working (1934) and Kendall (1953) suggested that prices follow a random walk. Osborne (1959) work determined that stock price changes bore similarities to "brownian movement particles suspended in liquid".

Both Robert's and Osborne's articles stimulated much of the discussion about the Random Walk theory and led to the flow of many articles on the subject, such as Alexander (1961), Cootner (1962), Moore (1964), Granger and Morgenstern (1963), Fama (1965), Samuelson (1965), and Mandelbort (1966).

Definition of Capital Market Efficiency:

The term efficiency in the finance field usually refers to the informational efficiency. Different definitions of market efficiency appeared on the literature and we will list some of these below. Connecting the random walk with the economics of competitive markets appeared in Roberts (1959) a definition which is regarded the foundation for the economic theory:

> "If the stock market behaved like a mechanically imperfect roulette wheel, people would notice the imperfections and by acting on them, remove them."

After the Roberts definition a range of other definitions appeared about the term efficiency, for instance in 1975, Rubinstein defined the market efficiency based on information distribution [1975, p. 812]:

> "In a perfect and competitive economy composed of rational individuals with homogenous beliefs about future prices, by any meaningful definition present security prices must fully reflect all available information about future prices".

Fama offered a very broad statement on defining the efficient market [1976, 143-144]:

> "Market efficiency requires that in setting the prices of securities at any time t, the market correctly uses all available information"

Another definition was offered by Jenson [1978, p 95]:

> "A market is efficient with respect to a given information set if it is impossible to make profits by trading on the basis of that information set. By economic profit is meant the risk-adjusted return net of all costs"[1]

Dyckman and Morse provide a definition for the informational efficiency [1986, p. 122] :

"A securities market is generally defined as (informationally) efficient if:

1) The prices of the securities traded in the market as though they fully reflect all available information.

2) These prices react instantaneously and in unbiased fashion to a new information."

Actually, the first attempt to have a formal model for efficiency came from the review of Fama (1970) which was based on how the market uses information and this was the central theme of Fama (1965) and Fama, Fisher, Jenson and Roll (1969).

Fama (1970) points out that the term "fully reflect" in his description of an efficient market is so general that it has no empirically testable implications and in order to make the model testable, the process of price formation must be specified in more exactly what is meant by the term "fully reflect". One possibility would be to express the definition in terms of expected return or "fair game", the model can be described notationally as in Fama (197) as follows:

$$E(\tilde{P}_{j,t+1}|\Phi_t) = [1 + E(\tilde{r}_{j,t+1}|\Phi_t)]P_{j,t} \qquad (1)$$

where

E = the expected value operator

$P_{j,t}$ = the price of security j at a time t

$P_{j,t+1}$ = its price at t + 1

$r_{j,t+1}$ = the one - period percentage return

$= (P_{j,t+1} - P_{j,t}) / P_{j,t}$

Φ_t = a set of information to be fully reflected in the price at t

$\tilde{}$ = indication of random variables at t

The value of the equilibrium expected return $E(\tilde{r}_{j,t+1} / \Phi_t)$ projected on the basis of the information Φ_t would be determined from the particular expected return theory at hand. The conditional expectation notation of (1) is meant to imply, however, that whatever the expected return model is assumed to apply, the information in Φ_t is fully utilised in determining equilibrium expected returns. And this is the sense in which Φ_t is "fully reflected" in the formation of the price P_{jt}.

The assumption that is required is that the conditions of market equilibrium can be stated in term of expected returns. The expected return or "fair game" model eliminates the possibility of profitable trading systems based only on information in Φ_t.

The proof of the "fair game" model is provided by Fama (1970) as being

$$Z_{j,t+1} = r_{j,t+1} - E(\tilde{r}_{j,t+1} / \Phi_t) \quad (2)$$

then:

$$E(\tilde{Z}_{j,t+1} / \Phi_t) = 0 \quad (3)$$

so that the sequence (Z_{jt}) is also a "fair game" with respect to the information sequence $\{\Phi_t\}$.

In economic terms, Z_{jt+1} is the return at t+1 in excess of the equilibrium expected return projected at t.

Let:

$$a(\Phi_t) = [a_1(\Phi_t), a_2(\Phi_t), \ldots, a_n(\Phi_t)] \qquad (4)$$

be any trading systems based on Φ_t which tell the investor the amounts $aj(\Phi_t)$ of funds available at **t** that are to be invested in each of the **n** available securities. The total excess market value at t+1 that will be generated by such a system is:

$$V_{t+1} = \sum_{j=1}^{n} a_j(\Phi_t)[r_{j,t+1} - E(\tilde{r}_{j,t+1} / \Phi_t)] \qquad (5)$$

which forms the "fair game" property (3), is expected to result in:

$$E(\tilde{V}_{t+1} / \Phi_t) = \sum_{j=1}^{n} a_j(\Phi_t) E(\tilde{Z}_{j,t+1} / \Phi_t) = 0 \qquad (6)$$

One of the special cases of "fair game" model is the Random Walk model which assumes that successive price changes are independent and identically distributed. It should be noted, however, that although the independence of successive price changes is consistent with an efficient market, it is not necessary condition for market efficiency. The writings of Manelbrot (1966), Samuelson (1965) and Fama (1970) and others made this obvious with regard to the submartingale model which assumes that the expected value of the next period's price, as projected on the basis of the information Φ_t, is equal to or greater than the current price. It is expressed in notational terms as follows:

$$E(\tilde{P}_{j,t+1} / \Phi_t) \geq P_{jt}, \text{ or equivalently, } E(\tilde{r}_{j,t+1} / \Phi_t) \geq 0 \qquad (7)$$

This implies that any trading rules based only on the information in Φ_t cannot have greater expected profits than a policy of always buying-and-holding the security during the future period in question.

Fama (1970) divided the efficient market hypothesis into three forms: the weak-form, the semi-strong-form and the strong-form of the market efficiency. This terminology has achieved widespread circulation despite Fama (1991) review of market efficiency which divides the studies into return predictability, event studies and private information. The market is efficient in the weak sense (return predictability) if share prices fully reflect all information contained in past share prices. The market is semi-strong (event studies) efficient if share prices reflect all publicly available information. The market is strong-form efficient (private information) if the public or private information is fully reflected in share prices and if any kind of investor can not systematically make an excess profit. Fama also investigated the conditions of the Efficient Market Hypothesis, and he put them as follows:

1) There are no transaction costs in trading securities.
2) All available information is costlessly available to all market participants.
3) All agree on the implications of current information for the current price and distribution of future prices of each security.

The strict conditions for a perfect market are not necessary for an efficient capital market. It is necessary here that no individual influences the market, that relevant information is available to investors, and that costs of dealing are not too high. The aggregation and resolution of expectation in the transaction produces unbiased valuations in efficient market.

Thus we have the efficient market hypothesis: that the prices of securities rapidly reflect all price-sensitive information and the hypothesis should be subject to various tests. However, in his second review Fama (1991) stated that there are positive information and trading costs which make as he stressed the extreme version of the market efficiency hypothesis descriptively invalid.

3.3 Debate of Market Efficiency Definition:

The definition of the EMH as it was stated by Fama(1970) raised a number of debates and criticisms which continued for almost two decades starting from Le Roy (1976), Bethlehm (1979), Grossman and Stigiltz (1980), Beaver (1981), Hatzoulis and Stark (1981), Ferguson (1983), Rosenberg et. al. (1985), Treynor and Ferguson (1985) and Engel and Morris (1991). Some of these debates in general framed the efficiency construct in the language, logic and the assumptions of the information economics literature (Ball, 1992). However, despite all the criticisms, in the absence of an alternative model, the EMH as presented by Fama is still adopted by researchers in the field.

Le Roy (1976) criticised Fama's model for being tautological in that all it says is the expected deviation of a realisation from its expected value is zero. He adds that the model cannot properly characterise an efficient market because it has no testable implications. Fama (1976) responded by denying the tautology, although he agreed that the model is not presented in a testable form. Thus he presents the model in a different way:

$$E(\tilde{R}_{jt}|\Phi_{t-1}) = E_m(\tilde{R}_{jt}|\Phi^m_{t-1})$$

where

$E(\tilde{R}_{jt}|\Phi_{t-1}) =$ is the expected return

$E(\tilde{R}_{jt}|\Phi^m_{t-1}) =$ is the equilibrium expected return on security j

The implication of this model is that in an efficient market, trading rules with abnormal expected returns do not exist.

Bethlehm (1979) put forward a number of arguments related, firstly, to the nature of the empirical tests; secondly to the general applicability of the EMH; and thirdly, to its deductive ability. The trouble seems to arise in the final reckoning because the EMH appears to confuse efficiency and rationality (i.e. investors are assumed to behave rationally). He argued that in cases where investors are irrational, although the capital market may still be efficient in terms of the EMH, it may fail to lead to the efficient allocation of resources of on economy at a macro-economic level. Therefore, Benthlehm argued, unless the meaning of market efficiency is restated so as to include both its micro-economic and macro-economic influences, then the EMH, as currently stated, should be regarded as only a partial statement of the truth.

Grossman and Stigiltz (1980) argued that prices cannot perfectly reflect all available information, because information is not costless; otherwise people would not spend money to obtain it to the extent that they would not receive any compensation for doing so. They identified two types of costs associated with an individual's decision as to whether to spend

money in order to acquire information or not: firstly , the costs of actually gaining access to data, and, secondly, the costs of processing available data. They argued that those who do pay money to acquire information, then trade on the basis of what essentially constitutes their better forecast of the future, do so at the expense of those who have chosen to remain uniformed. Therefore, in equilibrium, the fact that the informed investors have paid for their information implies that there will be a return on this outlay which, in itself, implies that the price of an asset in the market will not reveal all of the information of informed and the uninformed. However, it should be mentioned that Grossman and Stiglitz did not comment on this point at all, the existence of investors who choose to pay, in order to acquire information may not be due to the fact that they can consistently obtain a return on this outlay; rather, it can be due to the point made by Lorie and Hamilton (1973). Henfrey, Albrecht and Richards (1977) and Firth (1977) that in order for the EMH to be true, one necessary condition is that investors do not believe in it. Thus, it may be that disbelief which motivates spending on information rather the fact that such spending can create an increased return for investors.

Beaver (1981) criticised Fama (1970) for his imperfect definition of the information set (Φ). He argued that we should restate the EMH so that heterogeneous beliefs and information are allowed. He suggested that we should dichotomise the information set into two sub-sets, one referring to the information systems efficiency (n) and the other to the signal's efficiency (y), where y is the signal of information received by a particular individual at a time t, and n is the information system of that individual (signals as well as information differ from individual to individual). A security market is efficient with respect to an information system, only if signal efficiency holds for every signal perceived.

Hatjoullis and Stark (1981) argued that there is a problem associated with testing the EMH to the extent that the researcher must specify, apart from the form of the EMH, a model through which the EMH empirically will be tested against empirical data. It follows that the tests carried out are joint tests, that is, tests of the validity of both the EMH and the model used and, therefore, if the results point to a rejection of the EMH, one cannot say with absolute certainty whether the EMH or the model used to test it (or both) are really rejected. Their argument is not a denial of the EMH, rather, an attempt to raise certain questions regarding the ability of empirical research to verify or deny the validity of the EMH.

Ferguson (1983) illustrates four obvious areas for the stock market to be inefficient. Those areas concern information, analysis, judgement, and idiosyncratic behaviour. Rosenberg et. al. (1985) suggest two strategies (book/price strategy and specific return-reversal strategy) in detecting market inefficiency and show still larger profits to be made. Treynor and Ferguson (1985) show that the past prices, when combined with other valuable information, can indeed be helpful in achieving unusual (abnormal) profit. However, it is non price information that creates the opportunity. Sorensen discussed in the same paper that their assumptions (explicit and implicit) pop up throughout the manuscript. Therefore a review of them adds clarity and puts the model in prospective.

Finally, The discussion of the challenges to stock market efficiency by Engel and Morris (1991), where the they exposed and evaluated studies of mean reversion. These studies have an issue of casting doubt on the statistical ground of the classical tests of weak form efficiency, which is seen here as part of the debate of the limitations and the anomalies of the efficiency which will be briefly discussed on the next section. Engel and

Morris (1991) found that the evidence of stock prices might be mean reverting is not strong enough to rule out market efficiency. Based on their review of the mean reverting studies they demonstrated that these studies show that stock prices are not mean reverting for two reasons, firstly, the statistical tests applied on these studies are not very accurate for the lack of the long-horizon stock return. Secondly, the case of other studies which showed result of mean reverting stock prices, they gave weaker supporting results when the pre world war II period is excluded.

3.4 Efficient Market Anomalies: the Case of the Day-of-the Week and Calendar effects:

There are limitations to the capital market efficiency known as anomalies which caused a debate to the large volume of empirical research of the capital market efficiency. Such documented anomalies in price behaviour include apparent under-reaction, apparent over-reaction and the variation of expected returns as a function of the day-of-the week effect, month, size, market/book ratio, dividend yield, earnings yield and other variables that have been difficult rationalise[2]. Ball (1992) in discussion of what we know about market efficiency raised the question of the wide range of anomalies that had effected the efficiency as a construct and of our knowledge of asset pricing. He also raised important points in the anomalies debate; first about the bulk of research evidence against market efficiency which occurs where research designs are most sensitive to limitations in our knowledge of asset pricing. Second, the anomalies evidence provides an intriguing set of puzzles for researchers to resolve. Third, as the stock markets are competitive, he expected the anomalies issue will be solved in favour of the efficiency.

As just mentioned above, there has been a growing literature on anomalies of the stock market, however, the purpose of this section is to shed light on the day-of-the week effect studies and not to list detailed reviews of the empirical work of anomalies. From these studies we adopted the methodology which is tested in chapter 6 to dictate the day-of-the week effect.

A specification is made here by discussing the issue the day-of-the week and calendar effects. Recently, several statistically significant patterns in stock market returns have been identified. The existence of market regularity would contradict the EMH which requires that capital market returns should be characterised by a lack of any ex-post regularities. Seasonal returns would mean the stock market is not efficient informationally. They might not generate excess returns because of the transaction costs, but they can encourage market participants to trade to increase their portfolio returns. These patterns of seasonal and day of the week effect has violated the weak form of market efficiency to a certain extent (here many of the studies do not show a significant profit after deducting for the transaction costs) which has made it of particular interest to researchers.

The seasonal regularities can be categorised into four main areas : the day-of-the-week effect, the turn-of-the month effect, the turn-of-the year effect, and the holiday effect.

Rozeff and Kinney (1976) found a seasonal patterns in an equally weighted index of prices on the New York Stock Exchange for the period 1904-1974. The average monthly return in January was about 3.5 percent, while other months averaged only .5 percent.

Further, there has been research on the day-of-the-week patterns on equity returns. French (1980) observed consistently lower returns for Monday. In fact, the mean returns for Monday were negative for 20 years during 1952-1977. Gibbons and Hess (1981) extended French's work using sophisticated econometric techniques including value weighted and equally weighted portfolios constructed form. The data from the Centre for Research in Security Prices tapes (CRSP) only consists of, 30 individual stocks comprising the Dow Jones Industrial Average, US treasury bills, as well as the S&P composite index for 1962-1982. Their results show consistently lower returns for Mondays on all instruments included in the study.

Lakonishok and Levi (1982) offer a partial explanation of the Day-of-the-week effect based on delays between trading and settlement in stock and clearing checks.

Jaffe and Westerfield (1985 a,b) found that there is a day-of-the-week effect in stock market returns of Japan, Canada, and Australia. Tuesday also has the lowest return.

Harris (1986) found that, for large US firms, most of the negative returns occur between the Friday close and the Monday open, but for small US firms most of the negative weekend effect takes place during trading on Monday.

Keim (1983) found that the U.S. market exhibited large returns in the month of January, especially during the first five trading days in January. Keim also noted that the January effect was closely interrelated with the

firm size effects. He found that around 50 percent of the size effect was concentrated in January.

Ariel (1987) suggested that stock returns in the US. markets are positive only for days immediately prior to and during the first half of the calendar months and are indistinguishable from zero for days during the second half of the month. This monthly effect is independent of the January effect documented by others, and it seems to be caused by a shift in the mean of the distribution of returns from days in the first half of the month relative to the days in the second half.

Theobald and Price (1984) used the daily stock returns of the UK market to reveal the impact of thin trading on the day-of-the week effect. They affirmed that thin trading of stocks within an index tends to reduce the day-of-the week effect of the index. Based on the FTO and FTAS indices, they confirm that the magnitude of the negative Mondays returns is greater for the FTO index which consists of only about 30 actively traded stocks and hence less affected by thin trading.

In a cross-sectional UK study. Choy and O'Hanlon (1989) used shares chosen from the 750 which comprise the Financial Times All Shares Index (used by Theobald and Price). Their study found low weekend returns and seemed to confirm that, the UK daily seasonality was stronger in large frequently-traded issues than in small infrequently-traded.

Other studies of other world stock markets have shown seasonality. Gultekin and Gultekin (1983) examined the seasonal tendencies to find January returns to be exceptionally high. In Belgium, the Netherlands, and Italy, the January returns exceed the average returns for the year, while

the tax loss selling cannot explain this phenomenon in many countries. There is no capital gain tax or loss offset in Japan, yet the January effect nonetheless exists. A January effect existed in Canada prior to 1972. The tax years in Britain and Australia begin in April and July, respectively, yet abnormal January returns exist.

L. Condoyanni et al. (1988) examined the week-end effects by taking a sample from different markets in; the US, Canada, UK, France, Australia, Japan and Singapore applying similar methodology done by other researchers examining this phenomenon in the US market. They found out that weekend effects are the norm rather than being US-specific and, to some extent, their conclusions match those of an independent study by Jaffe and Westerfield (1985). Furthermore, they established that inclusion of a January factor does not significantly alter the pattern of day-of-the week effects, and provide evidence to suggest that the influence of the US market disguises the weekend effect in other markets.

Insup Lee et al (1990) tested the data of daily closing prices over nine years between January, 1980 and December 1988 on the major indicators for the exchanges in: Hong Kong, Japan, Korea, Singapore, Taiwan, and the US. Their study suggests that important day-of-the week effects can be identified in Asian Markets. While the results continue to show such effects for the US and Japanese equity markets, those in Hong Kong, Korea, and Singapore are significant, though on average of a lower order of magnitude.

Solinik and Bousquet (1990) tested for the day-of-the week effect on Paris Bourse by using the daily returns of CAC index (weighted index). Their finding is contrary to the finding of the American Market that is to see

there result have a strong and persistent negative mean returns on Tuesday. The forward settlement procedure can not explain the negative mean return observed on Tuesdays. However, the Tuesday effect of their study is similar to the finding of Jaffe and Westerfield (1985) and Condoyanni et al (1987).

As we can see from the above, the results of these events are held as one issue of the anomalous. Foster (1986, p.399) has commented that despite the anomalous evidence the efficient market model is an important one in the literature. Reasons for the importance of the model of the efficient market; (a) competing models are not well established (b) non-market efficiency explanations for anomalous evidence exist. Foster further put the explanation for anomalies as follows:

1) The anomalies are concentrated in a specific time period or on specific subset of firms.
2) The specific asset pricing model in the research is not descriptively valid.
3) Biased or inefficient estimates of the parameters of the chosen asset pricing model are used in the research[3]

Finally, considering the significance of the debate concerning efficiency as it affects investors. Simon Keane (1991) argues that the alleged disaffection has been overstated because of the fundamental confusion about the nature of market efficiency [1991, p 30]:

> "The fundamental active versus passive investment dilemma has been misleadingly allied too closely to the perceived validity of the efficient market theory. As long as EMH is tainted by anomalous evidence, there will tend to be a presumption that active

> investment has a valid claim to remain the investment norm. The most significant lesson of recent market history, however, is that unexplained price behaviour is not necessary irrational, and that irrational behaviour is not exploitable, and finally that exploitable behaviour is not necessarily worth exploiting."

3.5 The Role of Transaction Costs in an Efficient Market:

The spread is a very important part of the transaction costs paid by investors when dealing on the stock markets. The quoted Bid-Ask spread is the difference between the ask price quoted by a dealer and the bid price quoted by a dealer at a point of time (Stoll, 1989).

The earlier empirical work of Ball and Brown (1968), had stated a relationship between the efficiency and the transaction costs, and that they accepted the efficiency of the market on the ground that the post-announcement abnormal returns tested by them is actually less than the transaction costs of the market.

The definition of the efficient market by Jenson (1978) included the mentioning of transaction costs as follows:

> "A market is efficient with respect to information set if it is impossible to make economic profits by trading on the basis of information set. By economic profits, we mean the risk adjusted returns net of all costs."

This definition gave an introduction of the economics of the market trading mechanism. In actuality trading mechanisms are not free to operate and the market institutions, e.g. the market makers, had to have an effect on these transaction costs of these trading systems. In a recent article by Fama (1991) as he defines the efficiency that the security prices fully

reflect all available information and in a further recognition of the transaction costs he stated;

> " Since there are surely positive information and trading costs, the extreme version of market efficiency is false"

A number of researchers have examined the effect of the spread on transaction prices[4] these are; Niederhoffer and Osborne (1966), Cohen, Maier, Schwartz and Whitcomb (1986) and Gloston (1987), Stoll (1989), Roll (1984), Kiem (1989), Harris (1990) and Hsia, Fuller and Koa (1994).

An interesting contribution to the capital market efficiency literature was made by Roll (1984). His method improves the understanding of the market microstructure by providing a means for inferring the realised bid-ask spread from security market prices. The bid-ask spread is an important part of the transaction costs which is paid by investors. Financial scholars and practitioners are interested to know the transaction costs as mentioned by Roll [1984, p. 1127]:

> "Financial scholars and practitioners are interested in transaction costs for obvious reasons: the net gains to investments are affected by such costs and market equilibrium returns are likely to be influenced by cross-sectional differences in costs."

The method is to remove the information effect on prices in order to determine the bid-ask spread and that is achieved by calculating the first-order serial covariance of the rate of return of security prices as follows:

$$S = 2\sqrt{-Cov}$$

Where S is the spread and Cov is the serial covariance.

It is necessary to have two major assumptions for this method, (1) the asset is traded in an informationally efficient market., (2) the probability distribution of observed prices changes is stationary (at least for a short time).

To sum up, it is clear that the method logic in an efficient market is that the bid-ask price should be reflected on security returns.

In a further work which related the anomalies with the transaction costs Keim (1989) showed that a 2.8% average bid-ask spread for NYSE-AMEX stock. The indication from this result is that the average stock's calculated return cannot be relied upon within 2.8% accuracy. His comment about the turn-of-the year effect for the small-capitalisation stocks to a seasonal is the likelihood that trades are recorded at bid or at ask prices.

Glosten (1987) extended Roll Model by allowing for information asymmetry which was again extended by Stoll (1989), both studies ended up with the presence of the imaginary roots from $\sqrt{-\mathrm{cov}}$. However, Roll's work was criticised by Harris (1990) concerning his method of the " simple implicit measure of the effective bid-ask spread". Harris showed from his work that the spread estimates are imprecise if the standard deviation of return is large, relative to the size of the spread. His additional point that some problems associated with the daily data serial covariance spread estimates may be due to the unusual statistical properties of closing prices.

The most recent contribution to the literature of market efficiency was produced by Hsia, Fuller and Koa (1994). Their method is based on Roll's

assumption that they assume that the bid-ask spread should be reflected in security returns if the market is efficient.

They stated that the Roll method is affected by trying to take the square root of a negative number, the imaginary number phenomenon which affects the result obtained.[5] Therefore, they introduced their refinement (based on Roll's method) to improve the result by reducing the effect of the imaginary numbers. The method used the property of the first-order moving average process with the first-order serial covariance function in order to remove the systematic effect of the market movements. Their model is as follows:

$$r_t = \alpha + \beta r_{mt} + e_t$$

The method isolated the residual e_t from the market model to detect the cause of imaginary numbers (making use of the moving average property) and by removing the effect of the first component of the price changes, that is the true but not observable value changes which is related to the market movement. Then the second part of the price changes, the effective bid-ask spread for a traded security is inferred from the residual e_t rather than from the total return r_t (more detailed in section 5.5).

In summary, the transaction costs are important to all investors and the role of transaction costs in an efficient markets is gaining more weights on the literature which indicate that the more clear and defined the transaction costs, the less problems researchers in the field will have.

3.6 The Significance of Capital Market Efficiency:

Market efficiency has implications for investment, corporate finance, financial reporting, and government policy announcements.

The implication for investment is that an investor will have no logical reason to expect to earn higher-than-average return on security investment on a given level of risk except by chance. Investors should adopt a passive investment strategy so that there will be no resources spent on identifying securities that will earn a higher return except if investors have inside information. Keane [1987, p 28][6] argues the lesson of EMH:

> "The overriding lesson of the EMH for most investors is that it pays to be sceptical of any claims to superior investment performance. Chance allows those who trade buy-sell recommendations to the public to be frequently 'right'"

The implication for investment analysis and management, when analysing share price, there should be no extra effort beyond that required to make the market efficient. Where, in an efficient market, securities are "correctly" priced and the stock market then performing the necessary role of valuing shares. Here, the strong-form requires the responsible authorities to control inside trading.

Company management should devote its energies to identifying and executing profitable productive investments and should not devote resources to search for "optimum" financing strategies. Further to the implication of efficiency for company management, Keane (1983) argues that the implication to the suppliers of funds is that they should accept rather than seek to exploit the market's prices, so it implies that the users (agents) should accept rather than seek to exploit its signals.

Implications for financial reporting are: disclosure is very important to market professionals who can analyse and aggregate accounting information in the way they see best and second, the accounting information should be addressed to the price setters " expert market professionals" since they have the influence over investment. Keane (1983) emphasises that under capital market efficiency conditions, it is the expert professional as price setter who is the effective user of the related information and this calls for a change in financial reporting philosophy - from the traditional emphasis on the primacy of income and position statements to the provision of financial inputs for the market to process. It is the disclosure rather than accounting method that is the crucial issue.

The Implication for government policy announcement is that, reducing the uncertainty towards certain events (e.g. volatile behaviour of asset prices caused by uncertainty about future receipts and interest rates) could benefit the economy. Morris et al. states the rule of authorities in that aspects as follow [1986, p. 31]:

> "...The more confident the market in its expectations regarding the future, the less sensitive should asset prices be to news contained in current announcements, and clearly the authorities would seem to play an important role in this respect. Thus by announcing policy in advance, the level of uncertainty perceived by market participants should be lower in principle than if they had no information-provided always, of course, that the announcements are believed".

3.7 Weak-Form-Tests of Market Efficiency:

Studies of the weak form efficiency started long before market efficiency was defined. Weak-form-tests of EMH focus on the information content of the previous sequence of stock price movements. In An Efficient Market analysing past pattern for the purpose of predicting would be useless since all information would be reflected in the current price. Thus share prices are said to follow a ' random walk ' in which all future prices represent a random departure from the current price. The tests of the weak form fall into two broad categories:

1) One group of tests has set out to prove the EMH by measuring the statistical dependence between share price changes.
2) The other group has consisted of testing various trading rules which purport to beat a random selection of securities.

One popular method of analysing stock prices is to estimate the correlation coefficient between successive price changes over a long period of time. Any serial correlation between successive price changes can be measured statistically by means of the correlation coefficient. If there is a trend on the share prices, the correlation coefficient will be positive on a " scale between 0 and +1 ". If the price changes in the period tend to reverse changes in the preceding period , the correlation coefficient will also range between 0 and -1. The value of the correlation coefficient will be almost zero when there is no trend. Whether the natural log stock price changes may actually have finite variance and therefore be normally distributed is questionable. Fama (1965), Dryden (1970) and Juttner (1973) have found the distribution of log price changes deviated

from normality in the direction of leptokurtosis. Therefore, the formula of the serial correlation (shown in chapter 5) might not be a precise measure of the standard error of r_k. However, Fama (1965) argues that the serial correlation coefficient seems to be an effective tool in testing for serial independence when a large sample is used, even when the distribution of V_t has a possible infinite variance.

The most straight-foreword test for dependence is the runs test. A run is defined as a sequence of more than one price change of the same sign. For example, replacing the numerical value of price changes by a "+" when the change is positive, by "0" when there is no change, and by "-" when the change is negative, the sequence " ++0+--+++" consists of five runs. For given probabilities of a stock price increase or decrease, if positive changes tend to be followed by positive changes and negative changes by further negative changes, then the number of runs in a particular price series will be less than if the changes were independent. Similarly, if there is a tendency for positive changes to be followed by negative changes, and vice-versa, then the number of runs will be greater than if changes are independent. The weak form of the efficient market argues that the price changes from period to period are independent of each other, i.e., random. Essentially, these test attempts to find out whether a series of price changes is distributed randomly over time.

The weak form of the efficient market hypothesis argues that the sign and the magnitude of price changes from period to period are unrelated to each other, so that the correlation between sign and magnitude should be zero.

Prior to 1963, most of the statistical investigation of the weak form of the efficient market hypothesis had relied primarily on the techniques of the serial correlation and runs analysis as described above. However, around 1963 a variety of other sophisticated statistical techniques were brought to bear on the problem. A group at Princeton applied spectral analysis to the investigation of dependence in an economic time series. An information theory approach was also tried, as was the statistical Markovian theory. In several of these studies some degree of statistical dependence was discovered in stock price changes. However, for the most part, either the dependence present was not significant enough to develop profitable trading rules, or the dependence present was beset by other problems, such as nonstationarity. Thus, in general, the end result of each of these sophisticated analyses was essentially the same, that is, past price changes could not be used to predict future changes profitably.

Spectral analysis is a statistical method of testing for cyclical behaviour in a time series. Granger and Morgenstern (1963) use this approach on stock prices but find no significant relationships.

To meet the criticism of some security analysts, random walk model advocates have developed a second approach to testing the weak form of the efficient market hypothesis. This approach consists of comparing profits generated from the use of trading rules based solely on past security price movements with a random walk proxy (usually a buy-and-hold rule). If one can obtain greater profits by using trading rules than could be obtained from using a by-and-hold rule, then the implication is that some dependence must be present in stock price changes to account for the greater-than-normal profits.

A chartist trading scheme that has commonly been tested is the filter rule. Under this rule a stock is purchased if its price increases by x percent and is held until its price declines by x percent from a subsequent high. At this time the trader simultaneously sells and goes short, covering his position when the price increases by x percent from a subsequent low. Price movements of less than x percent are ignored. For filters ranging in size from 0.5 to 1.5 percent, this rule has been shown to generate greater profits than are earned if the stock is simply purchased at the beginning of the sample period and sold at the end, but only if action costs (commissions, clearing-house fees and the like) ignored in pursuing strategy are not taken into account. When these costs are included (they are substantial due to the frequent trades produced by small filters), the trader always does better under the buy-hold-alternative. The fact that this chartist strategy can be used to earn " abnormal " returns in the absence of transactions costs is evidence against a strict random walk hypothesis in stock prices, since it indicates a tendency for positive correlation in successive price changes. On the other hand, the departure from randomness is too slight to be useful as a forecasting device, since the excess profits available as a result of the observed correlation do not cover the costs involved in trying to exploit it.

3.7.1 U.S.A. Stock Markets:

Stock Markets in the United States have been most extensively examined and are generally reported to be well-organised and efficient. It is widely confirmed among researchers that the stock markets in the United States, most notably the NYSE, obey a random walk model.

Osborne (1959) found a high degree of conformity between movements in share prices and the law governing Brownian motion. The variance of

price changes over successively longer intervals of time increases in accordance with the length of time. This implies that the logarithms of price changes are independent of each other. A market in which successive price changes are independent of each other is a random walk market.

Since Osborne's study, many researchers have empirically tested the random-walk hypothesis in the United States. Newer studies performed during the 1970s and 1980s, including those done in Western Europe and the developing countries, in many cases followed the application of various statistical tests done on the New York Stock Exchange.

Roberts (1959) investigated the movements of weekly changes of the Dow Jones Index and found that their movements were very similar to a random series generated by a simple chance model. He also pointed out that the first differences of the numbers generated by the process look very much like the first differences in stock prices.

Moore (1962) was the first to use a randomly selected sample of individual prices for thirty stocks listed on NYSE. He conducted, by computer, statistical testing (autocorrelation test) from January, 1951 to December 1958. He found that the index of stock price relatives behaved differently from individual price relatives. The serial correlation coefficient for the index was +0.153 while 22 serial correlation coefficients of the 30 individual stocks displayed negative signs. He interpreted this result by reporting that an index of many stocks tends to average out the cross-sectionally independent forces, thereby affecting individual stocks and introducing the negative serial correlation of individual price relatives. His results strongly support those found previously by Osborne.

Granger and Morgenstern (1963) began to use spectral analysis, a method previously used with data in the physical sciences, to determine whether any cyclical patterns exist in stock price behaviours. The spectrum of a time series is a representation of the autocorrelation function of that series (through Fourier transformations). The spectrum analysis gives a complete picture of autocorrelations in any stationary stochastic process with finite variance. They found some evidence of slight monthly and seasonal cycles and suggested that the result might be caused by the mean return changing over time. That analysis can also support the random walk hypothesis.

Alexander (1964) thought that serial correlation tests and run tests were not appropriate in determining market efficiency because they were too rigid and that possible complicated dependencies in successive price changes must be investigated. He tried to devise trading rules based solely on price changes which can produce abnormally high rates of return. If he could find such rules, it would imply that price changes follow patterns and are not random. His filter technique seems to be successful since it allows the analysis of excessive rates of return [Alexander, 1964, p.7]:

> "The professional analysts operate in the belief that there exist certain trend generating facts, knowable today, that will guide a speculator to profit if only he can read them correctly. These facts are assumed to generate trends rather than instantaneous jumps because most of those trading in speculative markets have imperfect knowledge of these facts, and the future trend of price will result from a gradual spread of awareness of these facts throughout the market "

However, Fama (1965) and Fama and Blume (1966) uncovered Alexander's failure to adjust dividends correctly and to include transaction

costs. They pointed out that dividends were a cost rather than a benefit when stocks were sold short.

Over approximately five years, ending in 1962, Fama (1965) conducted a most careful and extensive study in this field. He studied the daily proportionate price changes of the 30 industrial stocks which make up the Dow Jones Average. He extended his investigation to test the possibility that lagged price changes show some dependence, and to confirm that the coefficient of serial correlation does differ substantially from zero. However, he observed a few extreme and unusual distributions of the correlation coefficients. The correlation coefficients tend to be heavily influenced by extreme distributions, is to examine the sign of the price changes. He obtained 735 as the actual number of runs when 760 runs were expected. The number of actual runs being less than was expected implies a very small positive relation between successive price changes. He concluded that his analysis of runs shows no indication of dependence between price changes which would bear any importance from either an investment or a statistical point of view. Most of the studies done after Fama (1965) more or less follow this framework.

Fama and Blume (1966) rigorously performed the most extensive filter rule tests for 30 United States companies. Their study consists of between 1200 and 1700 recordings with filter rules. They found that the only profitable filter was a .05 % filter among eight different filters ranging from 0.5 to 4.0 %. However, even with small transaction costs, these strategies were outperformed by buy and hold strategies. The profitability of the smallest 0.5 % filter rule is consistent with a slight positive correlation of stock price changes and fewer actual runs than expected in runs tests. They found that the returns from the filter technique were not as large as

the returns earned by simply buying and holding if the investor bypasses an intermediary's commissions. They concluded that the standard tools (serial correlation tests and runs tests) were probably as powerful as the Alexandrian filter rule for measuring the direction and degree of dependence in price changes.

Tests performed by Schwartz and Whitcomb (1977a, 1977b) and Rosenberg and Rudd (1982) indicate that the first-order serial correlation of daily return residuals from the market model are small but significantly negative. This implies that return residuals of one sign tend to be followed by return residuals of the opposite sign using a daily data. These results are not consistent with market efficiency. However, no trading strategies have been tested to determine if an abnormal return can be made after allowing for transaction.

Pencek, T. A. (1988) took a samples of 30, 34 and 30 shares respectively from New York Stock Exchange, American Stock Exchange and Over the Counter Market. The samples' period was from July 1979 to June 1984. applying the serial correlation test and the runs test. Most of the serial coefficients for New York and American Stock exchanges were very low. Serial correlation coefficients for over-the-counter were higher that NYSE and AMEX, also more stock of over-the-counter show significant coefficients but without strong linear relationship. The test of the serial correlation of the three markets showed similar results of small coefficients with very few significant. With regard to the runs test, results show randomness of stock price changes for NYSE and AMEX and on the other hand most of the price changes of the selected stocks of the over the counter market shown to be non random.

3.7.2 UK Market

Kendall (1953) made one of the earlier studies on the UK market about the behaviour of share prices. On the basis of his tests on the weekly prices of 19 indexes, he pointed out that [1979, p 41]

> " investors can perhaps make money on the stock exchange but not apparently watching price movement, and coming in what looks as a good thing. It is unlikely however that anything I say here will destroy the illusion of outside investors ".

The amount of research conducted in The UK market is relatively small in comparison with the US markets. The establishment of the London Business School data bank had an effect of removing away the difficulty of researching the efficiency of the UK market.

Brealey (1970) examined the serial correlation of daily capital gains in the FT-Actuaries index over 1665 days. The tendency for the market to persist manifested in a large first order serial correlation of .219. This seems to have been expected by Brealey when he said that [1970, p 38]:

> " the difficulty with all these tests of market behaviour is that the first order co-efficient will be biased upward if the prices used to calculate the index do not occur simultaneously ".

To make an allowance for the basis that can result from the use of non-simultaneous prices, he constructed an index of 29 frequently traded shares for 202 days and repeated his test. The serial correlation co-efficient of this new index (0.19) was, in fact, 40% lower than for the FT Actuaries index (O.32) when measured over the same period. This indeed represents a significant reduction but there still appeared to be some slight tendency towards positive dependence between successive daily returns. However, Brealey concludes that " The regularity observed in this

paper is almost certainly insufficient to be profitably exploited and does not seriously infringe the random walk hypothesis".

Dryden (1970) analysed the behaviour of 15 leading UK shares, using serial correlation, run test and filter tests. He used daily prices over the periods 1963-1964 and 1966-1967 and he found an absolute average of serial correlation coefficient of 0.09, 0.02 and 0.03 for 1,3 and 5 day differencing intervals respectively. He concluded that, in general, the results of tests used must be regarded as evidence in support of RWH and these conclusions are broadly in accord with the research carried out on America data.

Kemp and Reid (1971) looked at daily prices of 51 companies over 52 days. Using run tests and autocorrelation, they found that significantly non-random price changes existed in 80% of their sample, a figure that was reduced to 50% once " no change " data was removed from their price series. They stressed that their results " strongly support the view that the RWH has been over generalised ". However, they gave no clear indication of the size of the departures from randomness and they took no account of transaction expense in addition to the fact that they have used a remarkably short period. Therefore, as a consequence, their results cannot be used as a basis for invalidating the EMH (Henfrey et. al. 1977 and Granger 1975).

Grimes and Benjamin (1975) examined the movements of 543 UK stocks. They found that 80% of the prices did vary according to a random walk; further, the remaining 20% of the prices that did not vary according to the random walk model, were referring to unmarketable securities.

Grimes and Damant (1975) used the daily prices of 543 shares of the period of 1968-1971. Guy (1976) used the monthly percentage returns on 99 shares in the period 1960-1970. The first order serial correlation showed little significant correlation, which supports the random walk hypothesis.

Bertoneche (1978) used daily and biweekly percentage investment returns on 59 shares in the period 1966-1974. His findings, through his use of the first order serial correlation coefficients gave a significant daily correlation and little biweekly correlation, which supports the random walk model for the longer interval rather than the daily. The following table is including studies done on the U.K. market.

Table No. 3.1: Tests of Weak-Form of UK Market Based on Returns

U.K.					
Kendall (1953)	19 indices 1928-1938	Changes in weekly prices up to 29 weeks	Serial correlations	No significant serial correlations are reported	Accept the RWH
Dryden (1970)	15 shares 1/63-12/64	Daily price changes (and adjusted dividend)	Serial correlations Analysis of runs Proportions of shares showing increases, decreases or no change. Filters of variable sizes	Some dependence over short intervals of one and two days. Filter rules perform worse than a buy-and-hold strategy before allowance for transactions costs	Accept the RWH over intervals longer than 2 days
Kemp/Reid (1971)	51 shares Financial Times Index	Daily price changes (adjusted for dividends)	Analysis of runs Various non-parametric tests	77 to 50% of the sample exhibits non-randomness	Reject the RWH Market is inefficient over daily intervals
Solnik (1973)	40 shares 3/66-12/71	Daily, weekly, monthly percentage investment returns	First order serial correlation coefficients	Significant daily correlations (21/40) but non-monthly (1/40)	Accept the RWH over monthly intervals reject RWH otherwise
Guy (1974)	99 shares	Monthly percentage investment returns	First order serial correlation coefficients	Little significant correlations (9/99)	Accept the RWH

Grimes/Benjamin (1975)	543 shares 10/68-4/71	Daily prices	The distribution of the number of intermediate prices above an average price is compared to an expected distribution	Most shares do not exhibit randomness; particularly shares of small & medium firms	Mixed, market shows sign of inefficiency
Bertoneche (1979)	59 shares 4/66-7/74	Daily, biweekly percentage investment returns	First order serial correlations coefficients	Significant daily correlations (35/59) but little biweekly (13/59)	Accept the RWH over intervals longer than 2 weeks

Source: Hawawini, G. A. and P. A. Michael, (1984), European Equity Markets: Risk, Return, and Efficiency, 27-28, New York: Garland Publishing, Inc.

3.7.3 European Markets:

Similar tests on the dependency of share prices and the trading strategy have been applied on the European Markets.

Cristini (1978) considers the monthly returns on the 38 securities which form the sample used by the bank of Italy, ranging from 1966-1976. He regresses the time series of returns on itself lagged 1, 2 and 3 months. Of course, efficiency occurs if the coefficients of the lagged variables are not significantly different from zero. This does actually happen in the analysis, and hence the weak form efficiency is supported. Biffigandi & Stefani, in their 1981 paper, perform an analysis which differs not only for the data but mainly for the highly sophisticated underlying statistical treatment. In fact, they compute the differences in the log of the stock market index, as a proxy for the average returns, on a daily, weekly and monthly basis. The period covered is January, 1975 to December, 1979 and the data is fed into a Box-Jenkins model. It turns out that the daily returns (according to the definition given above) are adequately represented by a IMA (1,1) scheme, and obviously this is in contrast with the requirements of efficiency. Results for weekly and monthly returns display a different character. Indeed, for such data (and through the same methodology) efficiency seems to be sufficiently attained. This apparently contradictory result, explained by the authors with the suggestion that any information model acting on prices, can only be perceived in the very short term.

Beltsas and Tebbutt (1981) and Papaionnou (1983) used the monthly and daily data of the Greek Stock Market. Their results of the serial correlation and spectral analysis rejected the random walk over the monthly and daily interval.

Solnik (1973) attempted the first comprehensive tests of the random walk hypothesis by sampling 234 stocks from eight major European Stock Markets (Belgium, Britain, Netherlands, France, Italy, Germany, Switzerland and Sweden). He studied the distribution of the serial correlation coefficients of European stocks and compared his results with those found by Fama (1965). He also investigated the stationarity over time of serial correlation coefficients for individual stocks. He found that, although the random walk hypothesis adequately depicts the behaviour of the European stock prices, the deviation from a random walk is more apparent in European Stock Exchanges than American Stock Exchanges. He attributed this difference to the technical and institutional characteristics of European capital markets : loose requirements of disclosure of information, no control on insiders trading, thin markets, and discontinuity in trading.

Conrad and Juttner (1973) investigated the serial correlation coefficients and run tests of 53 German stocks over the period between January, 1968 and April, 1971. The results of their serial correlation tests showed that the majority of stock returns had significantly large negative serial correlation coefficients. In run tests, 19 stocks out of 54 stocks exhibited a trend. Their empirical evidence suggests that the random walk theory is inappropriate in describing the behaviour of stock prices in Germany.

However, Reiss (1975) doubted the validity of the data used by Conrad and Juttner. He used the same tests (autocorrelation tests and runs tests) with 54 stocks and supported Solink's conclusion, i.e., German stock markets are as efficient as those of other European Stock Markets at the weak-form level.

Guy (1977) focused solely on the German stock exchange. He examined more stocks (90 stocks) over a longer period of time (11 years) than the previous researchers. His analysis shows that, except for a high positive serial correlation of returns for larger companies, German securities have very similar properties to those of the other European Countries.

Jennergren and Korsvold (1973) studied 15 Norwegian and 30 Swedish Stocks; Cooper (1982) published a study covering 50 stock markets. All these studies tended to support the random walk model although to a lesser extent than it has been supported by U.S.A. research findings.

In 1974 Antti Korhonen conducted his study on weekly prices from 1966-1971 on 18 firms of the Finish Stock market. Those prices were adjusted for dividends and capital changes. His findings of the run and serial correlation tests were not quite as impressive as the American results.

In 1977 Peter Jennergren and Peter Toft-Nielson investigated the random walk hypothesis by conducting a test on fifteen Danish stocks traded on the Copenhagen Stock Exchange. Daily log price data for 1973-1975 were used. The methodology embraces run tests and spectral analysis. Their finding was that the random walk hypothesis should be rejected. There was evidence of deviation from normality, actual numbers of runs differed from these expected, and certain cyclical patterns in series of the stock prices differences. The table below show the studies of the European markets:

Table No. 3.2: Tests of Weak-Form of European Markets Based on Returns Distribution

Country, Author(S) Year of Publication.	Number of Shares or Indices Period of Analysis	Length and Definition of Returns	Statistical Tests Performed or Trading Rule Tested	Major Empirical Results	Conclusions
Austria Uhlir (1979)	52 shares, period from 1/1/65 to 31/12/74	Daily, weekly, 2 weeks and monthly price changes and log price differences (adjusted for dividends)	Analysis of runs, autocorrelations (up to 10 lag) , non-parametric tests, filter rules, and empirical frequency distributions	All stocks have significant first order correlations, significant dependence in price changes over very short intervals. Deviations from normality, distributions are leptokurtic	Reject RWH over daily return intervals, acceptable over longer intervals (biweekly and monthly)
Belgium					
Wouters (1971)	52 shares, 29 indices, period from 1/62 to 12/69	Weekly percentages investment returns, investment returns, daily percentages investment returns, period from 1/67 to 12/69	Serail correlations, analysis of runs, empirical frequency distributions	significanct correlation in daily returns. Some dependence over short intervals. Bimonthly distributions approach normality. Distributions are leptokurtic otherwise	Accept the RWH over monthly intervals

Solink (1973)	17 shares 3/66-4/71	Daily, weekly, monthly percentage investment returns	First order serial correlation coefficients	Significant daily correlation's (5/17) but none monthly (1/17). Correlation coefficient is stable	Accept the RW over monthly intervals
Bertoneche (1979)	21 shares 4/66-12/74	Daily, biweekly percentage price returns	First order serial correlations coefficients	Significant daily correlations (11/21) but none biweekly (2/21)	Accept the RWH for biweekly intervals
Denmark					
Jennergren/ Toft-nelson (1977)	15 most active shares 1/73-12/75	Daily log price differences (adjusted for dividend)	Empirical frequency distributions Analysis of runs Spectral analysis	Deviations from normality and presence of leptokurtosis. Actual number of runs differ from expected. Existence of cyclical regularities and recurrent patterns	Reject the RWH. Market is not efficient in a weak form sense over daily intervals
Finland					
Korhonen (1974) (1975)	18 shares 1/60-12/71	Weekly, monthly and quarterly price changes and log price differences (adjusted for dividends)	Analysis of runs, serial correlations up to 10 lags	Some significant order correlations (8/18 for first subperiod, 4/18 second subperiod) little dependence in price changes	Accept the RWH, (Results, however, are less conclusive than in the US and more conclusive as the return interval is lengthened)
France					

Solink (1973)	65 shares 21/10/68-31/12/70	Daily, weekly, monthly percentage investment returns	First order serial correlation coefficientsl	significant daily correlations (41/65) but none monthly (1/65). Correlation coefficient is stable	Accept the RWH for intervals of 2 days and longer
Greece					
Beltas/Tebbutt (1981)	16 indices 1/65-12/75	Monthly log price difference and percentages returns	Serial correlations up to 20 lags , Spectral Analysis, Regression analysis	significant devations from the random walk model	Reject the RWH
Papaioannou (1983)	25 shares 1/70-12/75	Daily log price difference (adjusted for dividend)	Serial correlations up to 10 lags, proportions of shares showing increases, decreases or no change	Returns are strongly dependant over one day lags	Reject the RWH over short intervals.

Source: Hawawini, G. A. and P. A. Michael, (1984), European Equity Markets: Risk, Return, and Efficiency, Garland Publishing, INC., New York, p23-28.

3.7.4 Studies of Non European Markets and Developing Countries Markets:

Studies of weak form efficiency on developing countries and Non-European countries (Australia and Japan) followed the methodologies of previous studies done on the US market, namely New York.

In 1978 Ang and Pohlman tested the weekly prices of 54 stocks from five far eastern countries, using the same methodology as Fama in 1965. The time periods covered were: (1) May 1970 to November 1974 for Australia; (2) September 1967 to November 1974 for Hong Kong; (3) May 1970 to November 1074 for Japan; (4) September 1973 to November 1974 for the Philippines; and (5) May 1972 to November 1974 for Singapore. Stock prices were corrected for capital adjustments (stock split, stock dividends, etc.) The study concluded that, in general, far eastern stock exhibited greater standard deviation and departure from the normal distribution. In addition, the degree of the serial correlation coefficients of returns were generally very similar to those of European stocks, and in the case of Japan quite comparable to the United States. The table below show the weak form efficiency studies applied on the Non-European markets and developing markets:

Table No. 3.3: Non-European and Developing Markets

Name & Year	Country	Results
Ang & Pohlman (1978)	Australia, Hong Kong, Japan, Philippines, Singapore	Stocks' behaviour is similar to European, except Japan which is comparable to the US
Hong (1978)	Four Eastern Countries	Japan showed high efficiency and concluded larger markets are more efficient than smaller markets.
D'Ambroso (1980)	Singapore	Reject RW
Dodds (1983)	Hong Kong, Kula Lumpur, Singapore	Divergence from weak form
Barnes (1986)	Kuala Lumpur	High degree of weak form efficiency
Roux and Gilberston (1978)	Johannesburg	Did not confirm weak form

Al Mudhaf (1983)	Kuwait	Confirms weak-form with reservation toward regulation
Errunza and Losq (1985)	10 developing markets	Results are comparable to small European Markets.
Dickinson and Muragu (1994)	Nairobi	Results do not contradict with the weak form of the EMH

Also in 1978, Hong used weekly leading stock price indices of four eastern countries for the period covering September 1973 to March 1976 (132 weeks) to test for a random walk. He used both serial correlation and run tests. This study concluded that among these four eastern countries, Japan exhibited the highest efficiency in both tests. Since the Japanese market is larger than the other three markets combined, this study suggests that the larger markets are more efficient than smaller markets.

D'Ambrosio in 1980 used price indices of the Stock Exchange of Singapore (SES) to test for their conformity with the weak form of the efficient market hypothesis. In order to determine the presence of trends and the degree of price dependency, this study applied runs and serial correlation tests to the daily closing values of the six major SES indices. Three of the indices, industrials, hotel, and Tins, did not conform to the random walk hypothesis.

The other three indices were dependent in the run test but exhibited low serial correlation coefficient, especially at short lagging intervals. At larger intervals, all indices were highly correlated from one period to the next. In almost all instances the serial correlation coefficients for the SES are greater than those found on the other equity markets in the United States, the United Kingdom, and Australia. Overall, D'Ambrosio concluded that SES indices did not behave in a manner consistent with a random walk; that is, the run tests revealed much higher variations than the expected percentage variations and the serial correlation coefficients were consistently higher than expected. The appearance of comparatively low serial coefficients for three of the indices; Financial, Property, and Rubber was not sufficient empirical evidence to accept the random walk hypothesis for the entire SES.

Using the monthly data of indexes for three markets, namely Hong Kong, Kuala Lumpur and Singapore, Dodds (1983) tested the weak form of EMH. He stated that his results broadly indicate efficiency in the weak form. He added that tests of the weekly and daily data of individual stocks indicated divergence from EMH.

Barnes (1986) conducted a study on the Kuala Lumpur Stock Exchange (KLSE), employing the monthly closing prices of 30 selected stocks, covering a six year period ending June 30,1980. This study employed the serial correlation test, the run test, and spectral analysis. The data used for the spectral analysis was restricted to the six indices of the KLSE. Using the serial correlation test only two stocks exhibited a departure from the weak form of the efficient market hypothesis at the 1 percent significant level. The spectral analysis indicated that all six indices conformed to the weak form of

the EMH at the 1 percent significance level. Overall, Barnes concluded that KLSE exhibited a "surprisingly" high degree of weak form efficiency.

Roux and Gilbertson (1978) investigated the behaviour of the daily prices of 24 industrial and mining shares in Johannesburg Stock Market for the period 1971-1976. The distribution of the price changes was found to be leptokurtic. They concluded that both tests (serial correlation and run tests), and in particular the run tests, provided some evidence that price changes were not completely independent, but it is unlikely that this dependence can be used to consistently increase the profits over a naive buy-and-hold strategy.

Al Mudhaf (1983) used the serial correlation technique on the daily prices of 30 companies. His results on the old Kuwait stock exchange showed that it was efficient but with the caution that other factors such as poor regulation could have affected the result.

In 1985, using monthly data Errunza and Losq investigated the behaviour of share prices on newly established LDC securities markets (Argentina, Brazil, Chile, Greece, India, Jordan, Korea, Mexico, Thailand, Zimbabwe) by using the serial correlation technique and the runs test. In general, their findings are comparable to the small European Markets.

Dickinson and Muragu (1994) studied the behaviour of the weekly data of 30 actively companies listed on Nairobi Stock Exchange by using the serial correlation and the runs tests. Their findings do not contradict with the weak form of the EMH.

There is an extensive and rich tradition of investigating the "fairness" of equity markets to see if price changes are random. The generality of these studies is that weak form efficiency is a widely distributed phenomenon.

3.8 Evidence of the Semi-Strong and the Strong Form Tests of Market Efficiency:

Since the primary aim of this study is to empirically apply tests of the weak form market efficiency and measure the transaction costs of the four Gulf Equity Markets, a less detailed literature review about the semi-strong and strong form of market efficiency will be given in this section. However, some good examples of reviews of the evidence pertaining to the semi-strong and strong form of market efficiency can be found in; Beaver, W., (1989), Watts & Zimmerman, (1986), and Foster, (1986).

Evidence of Semi-Strong Tests:

Before the formal model of market efficiency of Fama (1970), which divided the efficiency into three forms: weak, semi-strong and strong, a few studies had already empirically investigated the market reaction to certain information and market events. The origin of the semi-strong is mainly an empirical one which principally came from the study of Fama, Fisher, Jenson and Roll (1969) and also the studies of Ball and Brown (1968) and Beaver (1968). These were then later categorised as semi-strong studies or event studies as in Fama (1970 and 1991).

Semi-strong is the level of market efficiency at which all relevant publicly available information is fully and immediately reflected in security prices, including information such as published accounting statements for the firm as

well as historical price information. Supporting tests are usually produced in two forms: event studies and the record of mutual funds.

Ball and Brown (1968) found that the market anticipated most of the information before it was released and the anticipation was so accurate that the appearance of actual income numbers did not appear to cause any unusual jumps in the abnormal performance index (API).

Beaver (1968) studied the stock market reaction to earnings announcements. A notable innovation introduced was the use of trading volume as a dependent variable. He found that trading volume was above average around the earnings announcement dates.

Fama, Fisher, Jenson and Roll (1969) examined the process by which stock prices adjust to the information (if any) that is implicit in stock split. Their evidence suggested that, "in reacting to a split the market reacts only to its dividend implication". This reaction at least appeared by the end of the split month, which lends, according to their suggestion, considerable support to the fact that the market is "efficient" in the sense that stock price adjusts very rapidly to new information. However, the use of monthly data could make it impossible to detect the exact speed of price adjustments.

Pettit (1972) and Watts (1973) also measured the impact of dividends on stock prices. Pettit found that participants make considerable use of the information implicit in announcements of changes in dividends payments, whilst Watts concluded that once the earnings effect was controlled, the information content of a dividend was "trivial". Although they reached different

conclusions regarding the importance of dividend changes, they both found that share prices adjusted quickly to an announcement.

Kaplan and Roll (1972) examined the reaction of investors to the reporting of investment credits and change in depreciation methods. They concluded that [1972, p 226]:

> "Earnings manipulation may be fun, but its profitability is doubtful. We have had difficulty discerning any statistically significant effect that it had on security prices...security prices increase around the time of firm announces earnings inflated by an accounting change. The effect appears to be temporary firms that manipulated earnings seem to be performing poorly".

Foster (1973) studied the market's reaction to preliminary earnings estimates made by company officials. He found that investors reacted quickly to the announcement, since volume levels increased during the week of the announcement, but returned to the pre-announcement levels immediately after that week.

Firth (1972) examined the impact of share recommendations on share prices. He discovered that investors following these recommendations, usually found that by the next day the price of the shares had been marked up to a level which often took all the upside potential of the share. This is evidence that the information content of newspaper recommendations appeared to be fully incorporated into share prices almost immediately.

Franks, Broyles and Hech covered 70 successful mergers in the breweries sector in the UK between 1955 to 1972. They used residuals analysis to study abnormal share price behaviour around the time of the merger. The

objective was to see how the gains, if any, were allocated between the acquirer and the aquiree. The results show that virtually all the price movement ensuing from the mergers announcement is complete before the month is up. They suggested that an investment in the acquirer immediately after the announcement would probably not yield sufficient over the month to cover transaction costs. In addition, these results only confirmed that the market takes less than one month to fully discount the merger information. Frank et al. concluded that the market is efficient in the semi-strong form.

Patell and Wolfson (1984) used options transactions data (CBOE[7] data) to detect the speed of stock price adjustment to earnings and dividends announcements. They found that the stock price adjustment process appeared to begin prior to the public release of a news item and continued from one to four hours after the announcement. They also isolated a price effect at the beginning of trading on the day following the disclosures.

Miller and Reilly (1987), using the daily data, examined the mispricing of 510 initial public offers. Their results indicate that the market adjusts to any mispricing during the first day of public trading, and that excess returns are not available to investors in the after market.

Evidence of Strong Form

A market is strong form efficient if security prices reflect all information, public or private. There are two types of test that support strong-form efficiency. The first deals with the ability to use available public information and produce excess profit. The second is to deal with abnormal returns obtained by accessing inside information.

The empirical evidence shows that professional investment managers do not consistently realise superior portfolio returns. The mutual funds of the institutions have been the most frequently studied and from the studies that have been realised - Friend, Brown, Herman, and Vickers (1962), Sharpe (1966), and Jensen (1969), the conclusion is that the funds in fact do not out perform the market.

Dimson and Marsh (1984) analysed 4,187 return forecasts made for 200 of the largest UK common stocks provided by thirty-five different firms of analysts. They correlated actual return with forecasted returns and found an average correlation coefficient of 0.08. Therefore, the square of the correlation coefficient, $(0.08)^2 = 0.0064$, of the realised return is explained by the analysts's forecasts of return.

Elton, Gruber and Grossman (1986) utilised the data that was completed by investment group at Banker's Trust Company and marketed under the name IBOS. The data has over 1,000 classifications per month prepared by over 720 analysts at 34 brokerage houses, the research data base contained ranking on a five-point scale. A rating of 1 or 2 is recommended for buying with a ranking of 1 as favourable. The rating of 3 is neutral. A rating of 4 and 5 is recommended for selling, with 5 the least favourable. An analysis of forecasts prepared in the form of discrete classification is interesting because this is the form in which most decision makers in the financial community receive information. The study found that both the change in classification (e.g. from the best buy (1) to a buy (2) or hold (3) to buy (2)) and the classification itself contained information. Selling downgraded stocks or stocks that were in a lower classification or buying upgraded stocks or stocks

that were in a better classification could generate an excess risk adjusted return. Excess returns were found in the forecast (classification) month and for the two months following the classification. Acting upon the changes on classification would generate larger excess returns than the recommendation themselves. Furthermore, no superior forecaster could be identified. That is to say, following the advice of average censuses the forecaster would show real information that persists for a short period of time.

Jaffe (1974) studied the Securities and Exchange Commission (SEC) official summary of Security Transactions and Holdings, in an effort to clarify the information content of this report, with an examination of residuals from the market model before and after information disclosure. He concludes that insiders may in fact realise higher than average profits.

Also, with regard to insider information studies of Neiderhoffer and Osborne (1966), Lorie and Neiderhoffer (1968), Givoli and Palmon (1985) have shown that insiders do realise abnormally high returns from their trading. Seyhun (1986) concludes that "insiders can predict abnormal future stock price changes" and they "purchase stock prior to abnormal rise in stock prices and sell stock prior to an abnormal decline in stock prices".

Syed et al. (1989), probe as to whether trading on stock based on the inside information about the "Heard on the Street" column of the Wall Street Journal could generate abnormal returns. Their study is based on daily prices of 16 stocks identified by the Security Exchange Commission which are available on the Centre for Research in Security Prices (CRSP) tapes. Their results reported that the trading strategies based upon advance information on the

forthcoming HTS Column can yield a substantial two day abnormal returns of 6.25 percent between t=-2 and t=0. Their finding is consistent with other studies that disprove strong-form efficiency.

Even though the review of articles of the semi-strong and strong-form efficiency is brief their findings and the references mentioned provide the evidence, with few exceptions (some anomalies) that the semi strong is an acceptable phenomenon of the price reflecting all available information (public information). A review of the strong form does reveal that private information is exploitable by some investors.

3.9 Problems of Testing for the Weak Form and Other Related Work of Market Efficiency:

There are certain problems which affect the tests of market efficiency and as a consequence they will have an impact on the results. These issues (problems) are identified as follows:

3.9.1 The Thin Trading Issue

Thin trading can affect the results of the weak form and other related work of market efficiency. Thin trading happens when an asset is not traded at the end of the period which its return is measured. There are number of indicators (causes) of thinness, some of which have been identified as: share traded volume, the market value of share outstanding security, number of share traded, number of shareholders, frequency of transaction, density of limit order, arrival rate of limit and/or market order and the number of listed securities [Cohen et al (1978)].

The infrequency of share trading can produce serious biases in the results of empirical work. The major source of bias is the tendency for the prices recorded at the end of the period to represent the outcome of a transaction which occurred earlier in and prior to, the period in question. Widening the bid-ask spread an increase in the measurement errors can be introduced by non-trading [Dimson (1979), Margu (1990)].

3.9.2 Distribution of Share Prices Returns:

The serial correlation technique (defined in the data chapter 5) is to test the independence of the sequence of price changes. The series tested should be normally distributed or the variance is finite and when that is not the case, the inference of the results will be less accurate.

The field of accounting and finance relies on various parametric tests that assume the normality of distribution. Interpreting results from studies that assume normality, when the series (return) is not normally distributed could lead to a questionable interpretation [Theobald, (1986)].

Studies such as Fama (1965), Officer (1972), Blattberg and Gonedes (1974), Praetz and Wilson (1980), was characterised by hypothesizing that the distributions of rates of return on common stocks were not normal.

Describing the random variable in terms of distribution function will give a character to its behaviour. Properties of the sampling distribution are compared with properties of theoretical distribution functions so that a representative distribution can be selected.

The values of the random variable are placed into regions where a hypothesis tested is either accepted or rejected. When applying parametric tests it is essential to know what is the distribution of the data targeted. Therefore, when using parametric tests rejection of the null hypothesis is only equivalent to rejection at least one of underlying hypothesis, that of the weak form efficiency or that relating to the distribution assumption [Affleck-Graves and Mcdonald (1989)].

The following has been explained by Fama (1965, p. 41):

a) It is helpful to the investor to know the shape of the distribution of price changes. That is because the distribution is a major factor in determining the riskiness of an investment in common stocks.

b) It is important from an academic point of view to know the shape of the distribution. That is because it provides descriptive information about the nature of the process generating price changes.

Explanation of the distribution of share price returns by empirical studies are to follow:

a) The normal distribution
b) The stable paretian distribution [Fama (1965), Officer (1972)]
c) The student distribution [Blattberg and Gonedes (1974), Praetz and Wilson (1980)].
d) Other distribution [Press (1976), Affleck-Graves and Macdonald (1989)].

The assumption of the normality of the distribution of price changes is examined in this study in chapter 6 but the other above alternatives models of distribution of security returns will not be tested in this study.

3.9.3 The Timing Problems

A measurement of returns over different time intervals will happen when the prices are not realised simultaneously. In this case, the returns calculated here might have a different distribution from that of the fixed returns. This will mean that variances of returns will differ as they are calculated over different time lengths [French and Roll), (1986), Gibbon and Hess (1981)].

From the literature (e.g. section 3.7.2) it is noticed that the first order coefficient will be biased upwards if the prices used do not occur simultaneously. For example, Brealey (1970) in his work found that when he used the price index which is based on simultaneous price observations, the first serial correlation coefficient fell from .32 to .19.

The common observation of the data collected (explained in chapter 6) is that there are some days of the week where there is no trading for some individual companies. This produces problems of the (non) realisation of simultaneous prices and to timing problems.

3.10 Conclusion:

This chapter has reviewed the relevant literature on capital market efficiency. This area is extensively researched in the finance field and the number of the publications that have to be reviewed is vast. As the chapter shows many areas need further and better research. Additionally, conditions of the market

place change over time, which give importance to the fact that some of the earlier tests should be repeated. Researching this area is only possible with sophisticated computers and the availability of complete computerised databases.

Empirical evidence on market efficiency has been examined and the bases of the studies have been found to be different in several aspects; for example, different statistical techniques have been used in the studies reviewed, the behaviour of different series has been examined, prices of individual shares and share price index (s) examined. The daily, weekly and monthly time intervals have also been analysed.

With regard to the weak form of market efficiency, the review of the studies as appeared in this chapter of developed markets (e.g. NYSE and London) have confirmed that the prices in the future are not predictable by using past share prices. That gives support to the random walk model as an explanatory model of share price behaviour in these developed stock markets. It should be noticed that even though some studies have shown some departure from randomness in price changes, this may violate the random walk model, but might not violate the weak form of market efficiency. However, as section 3.5 reviewed, there are some unexplained seasonalities (anomalies) in otherwise efficient markets. Some of these seasonalities are also witnessed from the number of studies that were reviewed in developing markets.

In general, the evidence of the weak form of market inefficiency is not conclusive in emerging stock markets. This could be explained by the fact (a) that the behaviour of stock prices in these developing markets has a different

assumption other than the random walk, and (b) there is indeed inefficiency in these stock markets.

The important complementary part of the efficiency is the issue of the role of transaction costs. Estimating the spread is a measure by which to know the costs involved by an investor to deal in the market. An interesting theory was given by Roll and was applied in NYSE and this was followed by other critical studies of the American market. A significant extension to this literature should come from estimating the spread on the small and less developed markets. It is important to estimate the size of the spread for any subsequent weak-form tests. That is if the spread is say 1%, then a market reaction smaller than this cannot be measured.

The studies of the publicly available information (event studies) as we have reviewed and given reference to in this chapter, produced the evidence that developed stock markets (except anomalies) are efficient in the semi-strong form of capital market efficiency. The less developed stock markets lack the availability of publications of events studies.

The studies of strong form of the efficiency or the private information in the developed markets have shown that insiders seem to be able to get information that outperform the market and on the other hand studies of unit trusts and mutual funds have not been shown to consistently outperform the market.

There is a limited amount of empirical work available about the emerging capital markets and a good example of this fact is the Gulf Equity Markets.

The question of capital market efficiency is still yet to be conclusive in the developing markets. Even though the growth of the Gulf Equity Markets has been fast of late, the empirical literature is lacking a comparison of the Gulf Equity Markets. This study of comparing the four Gulf markets proposes to fill this gap.

Notes of Chapter 3

[1]Jenson, M.C. (1978), "'Some Anomalies Evidence Regarding Market Efficiency", Journal of Financial Economics, 6, 95-101.

[2] For selective survey of anomalies; cross (1980), French (1980), Banz (1981), Rogalski (1984), De Bondt (1985, 1987), Jaffe, Kiem and Westerfield (1989), Bernard and Thomas (1990) and Fama and French (1991).

[3]Foster,G., (1986) *Financial Statement Analysis*, 2nd edition, Englewood Cliffs, Prentice Hall., New Jersey,

[4]Glosten, L. R., (1987), "Components of the Bid-Ask Spread and the Statistical Properties of Transaction Prices," *Journal of Finance*, XLII, (December), p. 1293.

[5]Hsia, C., B. Fuller and G. Kao, (1994), " A Modified Method for Inferring the Effective Bid-Ask Spread from Security Returns," *Journal of Business Finance*, p. 243.

[6]Keane, S. (1987), Efficient Markets and Financial Reporting, Monograph, The Institute of chartered Accountants of Scotland, p 28.

[7] Chicago Board Option Exchange

Chapter IV: Survey Interview of the Gulf Equity Markets

4.1 Introduction

As we have discussed in an earlier chapter concerning their structure, the Gulf Equity Markets have undergone rapid changes. What makes the identification of those factors that hinder their development difficult, is the rapidity with which the changes occurred, coupled with the unique characteristics of the respective markets. However, in an attempt to identify the obstacles to growth and investment a series of interviews were conducted on the markets of Kuwait, Saudi Arabia, Bahrain and Oman. This chapter analyses some significant findings that have emerged from interview survey employing a semistructured questionnaire.

The difficulties of conducting a satisfactory survey are not small. In order to conduct such a survey an investigator needs to have a background about each market through earlier visits, to have collected pertinent information, to have read articles related to the subject, to be an Arabic speaker and to have credibility with the respondents.

It should be mentioned that it would have been impossible to conduct the survey interview without the help of the officials of these equity markets and certain individuals who use those same officials as useful connections[1].

This chapter is divided into four sections. The first discusses sampling techniques; the second covers data collection; the third data processing and data analysis; the fourth presents conclusions and the findings.

4.2 Sampling

For our purposes, a convenience sampling method was used to conduct the survey-interview[2]. That is to divide the market participants into group, then chose a representative number from each group. The criteria to choose the representative sample is: availability, willingness to cooporate and the recommendation and the suggestion of persons who either work in the equity market or who trade in shares. The first criterion is whether the person involved in the interview is available at the time the survey was conducted. The second criterion is the willingness of the person to cooperate in this survey. This was established by reaching him by telephone and explaining the aim of the research and giving a background about the interviewer. Third, the recommendation and the suggestion given by the staff of the equity market and the opinion of people who trade in shares often (especially those who we have a good contact with) to assist in identifying the suitable persons to be interviewed. Of the groups surveyed were: market regulators, brokers, fund managers, private investors and others.

It is worth saying a little more about each of these groups, the market regulators are those that hold a post of general manager, assistant general manager, or the head of the department at each stock market. The brokers are those who have a license to practice broking and who are actively involved in trading on the market. Because there is a large volume of trading done through the unlicensed stock offices in Saudi Arabia (Riyadh), we chose to include a few prominent ones. The fund managers are the type who work at commercial banks and other financial institutions and handle the local traded shares. The private investors are those who are actively involved in the market and own at least $ 100,000 value in

traded shares. Finally, the category of "others" includes those who hold middle management positions in the companies listed in each market, members of financial and economic consultancy offices, and other experienced individuals involved in the market dealings.

Whilst a convenience sample may not be representative of the underlying population, and can lead to biased parameter estimates, there was no evidence that the sample was biased. Certainly it was a considerable endeavour to achieve the samples, even on the basis described.

4.3 Data Collection

We conducted a structured field survey by interviewing a number of individuals from each of the markets: Kuwait, Saudi Arabia, Bahrain and Muscat. Each interview lasted between 30 to 70 minutes, with an overall average of 50 minutes.

Each interviewee was given the questionnaire to read and then given the choice of either filling out the questions himself or having his answer recorded by me (in some cases the interviewee was given the questionnaire before the interview). It was made sure that the interviewees understood all the questions in the questionnaire. The questionaire is reproduced in appendix No. 4.1 , and it is structured in four parts. Part one dealt with background information about the interviewee - country, job title and number of years spent in the job. In part two, the number of individuals surveyed were asked to rank in order of agreement, the number of factors and their related elements that were thought to be obstacles to investment and growth on each market. In part three they were asked to rank previous factors in terms of their importance from number one to ten. Part four consisted of an open-ended question where

interviewees were asked to specify the main obstacles to the development of the Gulf equity markets as important and successful stock exchanges.

The questionaire design was tested in a pilot study before being conducted for real. For this, interviews held with individuals from the Kuwait Investment Office (KIO), the Abu-Dhabi Investment Office and the Kuwait National Bank, all of which are based in London. Amendments were made to some of the wording of the questions and the order of some of the questions was also changed. Preliminary the discussions with UK based Gulf market professionals were useful in confirming that major factors had been covered unitil an acceptable version of the questionnaire was developed. The final English draft was then translated to Arabic and a similar procedure was undertaken to arrive at an acceptable Arabic version.

The main survey interviewing took place in each of the four countries: Kuwait (Kuwait City), Saudi Arabia (Riyadh), Bahrain (Manama), Sultanate of Oman (Muscat). I spent an average of ten days familiarising myself with each market and arranging interviews. Approximately 30 people were interviewed in each market giving a total of 112 for all the four markets. After finishing the survey interview for each market, findings were translated from Arabic to English which was a lengthy task. The survey was then checked for errors and each centre coded in preparation for the analysis. Despite the brevity of this account, it represented a considerable effort to achieve this level of response in four different countries.

4.4 Data Analysis

The interviews provided a wealth of anecdotal and background information on the functioning of the Gulf Equity markets, the operation of regularities

and the barriers to growth. Whilst this informs the data analysis, the presentation is structured around the formal quantitative analysis.

After providing a code for the structured questions, answers were entered into computer files for analysis. Our analysis of these answers was done using the SAS package. We shall now proceed to analyse the answers to each of the four sections of the questionnaire.

The data obtained for the first section provides vital background information about the interviewees. In the second section, the questions deal with factors that are regarded in general to be obstacles for growth and investment in the market. They are divided into elements, on a scale from 'agree' to 'disagree'. The analysis includes each factor with its elements and discusses the opinions elicited by the way of open-ended question. tables No. 4.2, 4.3, and 4.4 show an analysis of responses, in the form of frequency tables with their associated chi-square statistic. The analysis classified three ways: country analysis, job analysis, and analysis by years of work experience. Section three deals with ranking these factors on a scale 1 to 10. The fourth section is asking the respondents to list important factors that can make the Gulf Equity markets more successful.

4.4.1 Section One

The descriptive statistics which analyses the sample by country, type of job and the number of years of experience in the job, all of which is presented in table No. 4.1, 4.2, 4.3, and 4.4.

Table No. 4.1: Respondents by Country.

TABLE OF COUNTRY BY JOB

COUNTRY / Frequency / Percent	JOB: Broker	Fund Maneger	Market regulator	Private Investor	Other	Total
Kuwait	7	3	5	3	10	28
	6.25	2.68	4.46	2.68	8.93	25.00
Saudi Arabia	8	3	4	4	10	29
	7.14	2.68	3.57	3.57	8.93	25.89
Bahrain	4	2	7	2	13	28
	3.57	1.79	6.25	1.79	11.61	25.00
Oman	5	4	4	3	11	27
	4.46	3.57	3.57	2.68	9.82	24.11
Total	24	12	20	12	44	112
	21.43	10.71	17.86	10.71	39.29	100.00

The table above shows the five categories of respondents. In the first category are the brokers of which there are : 7 in Kuwait, 8 in Saudi Arabia, 4 in Bahrain and 5 in Oman. In the second category are the fund managers of which there are 3 in Kuwait, 3 in Saudi Arabia, 2 in Bahrain and 4 in Oman. The third category shows the market regulators, 5 in Kuwait, 4 in Saudi Arabia, 7 in Bahrain and 4 in Oman. The fourth category consists of private investors, 3 in Kuwait, 4 in Saudi Arabia, 2 in Bahrain and 3 in Oman. The last category shows "other" amounting to 10 in Kuwait, 10 in Saudi Arabia, 13 in Bahrain and 11 in Oman. The total number of respondents is 112.

4.4.2 Section Two

4.4.2.1 Analysis by Country

We pursue the analysis by first examining the responses by country as in table No. 4.2. The first question is on the need to increase the size of the market and it was sub-divided into which respondents were asked to indicate their agreement or disagreement as follows:

Q1a) To further develop the market, we need to increase the number of companies currently operating in the market.

Q1b) To develop the markets we need to allow more GCC companies to be listed.

Q1c) The market should be expanded to allow Non-GCC companies to be listed in the market.

Q1d) GCC citizens should be allowed to have a higher percentage of direct ownership of shares.

Q1e) Non-GCC citizens should be allowed to own shares.

Q1f) Indirect ownership of shares (e.g. International Funds) should be encouraged.

Q1g) No need is seen to increase the present size of the market.

Table No. 4.2: shows the responses catagorised by the country for all propostions raised for all the factors. First, we examine factor one, we find that the majority of respondents agree about the propostions: Q1a, Q1b, Q1c, Q1d and Q1f. However are there differences of opinion between the group of respondents in proposition Q1b, Q1e and Q1f. The difference of opinion in proposition Q1b is due to to the higher percentage of agreement (100%) by the Kuwaiti and Bahraini respondents. The less agreement , 34.48%, by the Saudi respondents is the cause of difference of opinion in proposition Q1e as shown by the chi square value at 5% significance level. Also, the less agreement from responses of the Saudi

market (37.93%) causes the difference of opinion between groups as shown by the chi square value at 5% siginificance level.

The question Q1g shows the broad support for expanding the present size of the markets. The opinion of the respondents is shown that 84 % disagree. There is no difference among the group of respondents in this view. There are some specific comments concerning these propositions including the open-ended section of the questionnaire.

1) The government should privatise some of its companies.
2) The proportion GCC citizens, Non-GCC citizens and international funds allowed to own shares in the market should be limited to 49% for individuals and 10 % for funds in any individual company.
3) Some of the requirements regarding the incorporation new companies should be less restricting.
4) Government influence on the stock market should be lifted.
5) Permission for other GCC companies to be listed on the local market should, initially, be restricted to those with proven, successful background.
6) If the foreign companies were to be admitted in the equity market, there should be some control on the volume of public saving going to finance foreign companies.

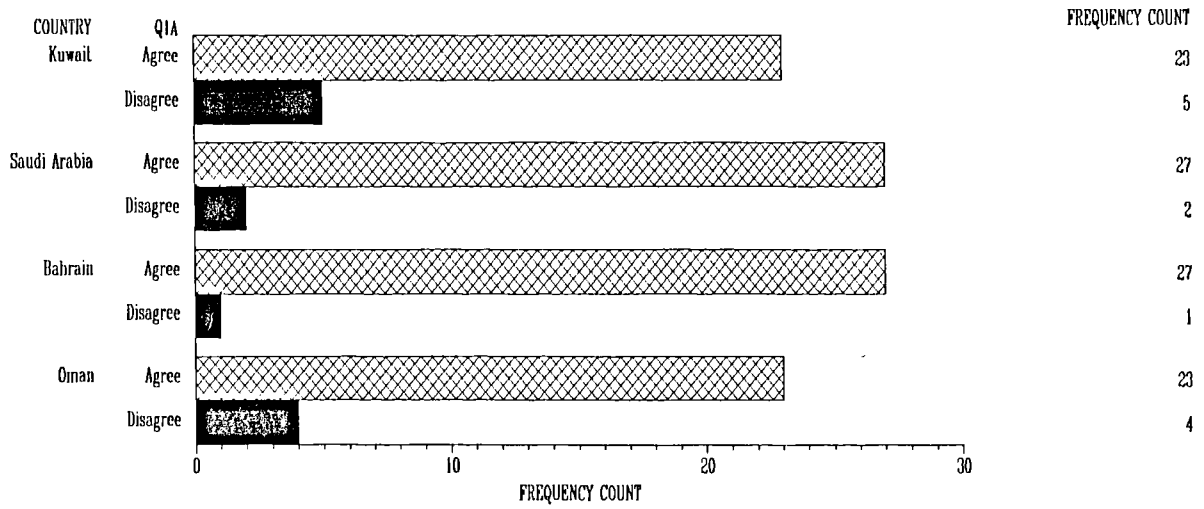
The following are the table No. 4.2 and figure 4.1 are the analysis by country and graph showing responses to Q1a.

Table No. 4.2: Analysis of Responses by Country

Proposition	% Agree	% Disagree	Chi X^2 Value	Chi X^2 Prob	Kuwait - % Agree	Saudi Arabia - % Agree	Bahrain - Agree	Oman - Agree
Q1A	89.29	10.71	3.903	0.272	82.14	93.10	96.43	85.19
Q1B	94.64	5.36	11.394	0.010	100.00	82.76	100.00	96.30
Q1C	67.86	32.14	10.890	0.012	82.14	44.83	67.86	77.78
Q1D	86.61	13.39	7.660	0.054	96.43	72.41	89.29	88.89
Q1E	73.21	26.79	31.451	0.000	89.29	34.48	78.57	92.59
Q1F	72.32	27.68	24.711	0.000	92.86	37.93	78.57	81.48
Q1G	16.07	83.93	3.034	0.386	14.29	24.14	17.86	7.41
Q2A	87.50	12.50	9.424	0.024	75.00	93.10	82.14	100.00
Q2B	98.21	1.79	1.966	0.579	96.43	96.55	100.00	100.00
Q2C	66.96	33.04	10.212	0.017	53.57	55.17	71.43	88.89
Q3A	86.61	13.39	6.789	0.079	92.86	96.55	78.57	77.78
Q3B	46.43	53.57	10.629	0.014	46.43	68.97	42.86	25.93
Q4A	84.82	15.18	8.957	0.030	96.43	68.97	85.71	88.89
Q4B	92.86	7.14	4.313	0.230	100.00	93.10	85.71	92.59
Q5A	83.04	16.96	4.954	0.175	71.43	93.10	85.71	81.48
Q5B	93.75	6.25	3.925	0.270	96.43	89.66	89.29	100.00
Q5C	84.82	15.18	12.748	0.005	78.57	68.97	92.86	100.00
Q6A1	94.64	5.36	2.324	0.508	96.43	96.55	96.43	88.89
Q6A2	95.54	4.46	2.311	0.510	100.00	93.10	96.43	92.59
Q6A3	90.18	9.82	3.196	0.362	92.86	82.76	89.29	96.30

Q6B1	90.18	9.82	8.043	0.045	100.00	93.10	89.29	77.78
Q6B2	95.54	4.46	8.540	0.036	100.00	86.21	96.43	100.00
Q6B3	91.07	8.93	15.155	0.002	100.00	89.66	100.00	74.07
Q6C1	22.32	77.68	5.498	0.139	32.14	27.59	21.43	7.41
Q6C2	19.64	80.36	1.729	0.630	21.43	24.14	21.43	11.11
Q7A	26.79	73.21	6.574	0.087	21.43	44.83	21.43	18.52
Q7B	30.36	69.64	15.132	0.002	21.43	48.28	7.14	44.44
Q8A1	89.29	10.71	2.043	0.564	92.86	82.76	92.86	88.89
Q8A2	77.68	22.32	19.094	0.000	71.43	89.66	96.43	51.85
Q8A3	86.61	13.39	5.546	0.136	92.86	86.214	92.86	74.07
Q8A4	67.86	32.14	12.586	0.006	53.57	93.10	57.14	66.67
Q8A5	68.75	31.25	6.629	0.085	50.00	79.31	75.00	70.37
Q8B1	88.39	11.61	5.853	0.119	100.00	82.76	89.29	81.48
Q8B2	47.32	52.68	14.869	0.002	78.57	34.48	35.71	40.74
Q8B3	44.64	55.36	14.679	0.002	71.43	48.28	35.71	22.22
Q8B4	33.04	66.96	6.056	0.109	35.71	44.83	35.71	14.81
Q8B5	65.18	34.82	10.751	0.013	82.14	48.28	53.57	77.78
Q9A	22.32	77.68	5.106	0.164	35.71	13.79	25.00	14.81
Q9B	88.39	11.61	11.504	0.009	96.43	96.55	71.43	88.89
Q9C	77.68	22.32	18.491	0.000	92.86	89.66	50.00	77.78

Figure No. 4.1: Increase the Number of Companies.



One particularly noteworthy comment provided by interviewees from Saudi Arabia and Oman was that the nominal value of shares should be split, thus allowing small investors to be involved in the market.

Secondly, factor two concerning the need for investors to be aware of the investments available in the market, was divided into two elements as follows:

Q2a) Informational facilities concerning stock market activity should be extended - to television coverage for example.

Q2b) Company disclosures should be made through more than one media , and in a way that is intelligible to all types of investor.

Q2c) Informational plan to arouse public awareness should be implemented, and introduced at the earlier stages of education.

We can see from table No. 4.2 that the proposition Q2a, Q2b and Q2c have a majority of agreement of 87.50%, 98.21% and 66.96% respectively and there is no differences among the group of respondents. There is a particular emphasis given to the recommendation that company

disclosures should manifested through more than one media channel in an understandable for all the different participant-types in the market and that is evidenced, by the fact that the market of Saudi Arabia and Oman have been recently established.

Certain comments also emerged in relation to propositions Q2a), Q2b) and Q2c) from the open-ended questionnaire:

1) Public awareness will benefit the market in many ways and one important way is to encourage demand on shares available on the stock market.

2) Specialised consultancy facilities that give advice to investors should be established.

3) Periodical visits to the stock market by students and public should be arranged.

Additional comments pertaining to Oman and Saudi Arabia are:

1) There is a need to run informative seminars for the public in all regions of the country to explain the importance and function of the stock market.

2) There is also a need for organised lectures concerning the stock market.

Thirdly, regarding the third factor on the need to additionally update and maintain the legal frame-work was broken down into:

Q3a) The government should do more to encourage investments and confidence in the market through suitable means.

Q3b) The legal framework should be changed.

The General consensus indicated that setting up procedures can further encourage investment and confidence in the market. This is reflected in by the percentage (as shown by table No. 4.2) of over 86%. There is no difference in opinion as shown by the chi-square value. To the second proposition Q3b, we see mild support for the opinion concerning the changing of the legal framework in with a difference of opinion among the group of respondents as can be seen from the chi-square value obtained being 10.129 with 5% sginficance level. That is due to the opinion in: Kuwait, Bahrain and Oman that favours less change concerning the need to review some parts of the law. On the other hand, we see more agreement in regard to the changing of the law in Saudi Arabia. This difference could be attributed to the need for an official stock exchange in Saudi Arabia. To this extent it differs from its Gulf partners as we discussed in chapter two.

The common responses for the open-ended suggestion provided by respondents are summarised as follows:

1) The government has to assure confidence in the market by following a series of procedures which will prevent any disaster such as the Al-Manakh crisis in 1982 in Kuwait or that which happened in US in 1929.

2) There is a great deal of need to enforce the law all times to all participants in the market.

3) The stock market has to be fully independent of the government.

4) The need is seen for a periodical review of the law and legislation concerning the stock market.

Additional comments were given with regard to the Saudi equity market:

1) A substantial volume of share trading is done outside the banks' trading units through unlicensed share offices which creates a real need for a clear and complete regulation regarding the trade done through those shares offices.

2) There is the need to have one authority only directly supervising the equity market (there are three governmental bodies currently in charge of the equity market).

The fourth proposition discussed was the need to reduce the importance of insider information by regulation and it was broken into two elements as follows:

A) Speculation dependant on inside information must be discouraged.

B) There should be strict enactment of insider law.

A comparable consensus emerged from responses concerning the proposition Q4a, that is the speculation dependant on inside information. The fact that it should be discouraged was evidenced by the percentage of 84% of responses, and with a chi-square value of 8.957 siginificant at 5% level which suggests that there is little difference of opinion between respondents, as revealed by table No. 4.2. Wide agreement among respondents from the four markets about proposition Q4b the need for the enactment of an insider information law is seen by an agreement of more

than 90% and the less significant value of the chi-square of 4.313 indicates a similar view, held by respondents from the four markets.

Other points of views that surfaced were:

1) Anybody who uses insider information ought to be publicly punished.

2) Any share trading discovered to be dependant on an insider information must be stopped immediately.

3) The need to inform the public about the danger of making decisions based on speculation.

Similarly, interviewees in Kuwait and Bahrain were of the opinion, too, that the stock market should be independent of dealing with any insider information. The likelihood of this happening might be reduced by letting the judicial authority inside the stock exchange to act independently when it comes to insider information. In regard to speculation, views in Saudi Arabia held that speculation indeed is commonly practised, while the price escalation in 1991-1992 was due to speculation.

Fifth, factor five it will be recalled, concerned current accounting standards and practises, related elements are:.

Q5a) There should be a local proficiency test for the accountants working in auditing offices.

Q5b) Companies' annual reports and other financial information should be standardised.

Q5c) Companies need to adopt one specific international accounting standards

With regard to the proposition Q5a and Q5b above, there is a general agreement manifested by responses of over 83% and 93% on the four markets with lower chi-square values, 4.95 and 3.92 respectively to reflect same opinion between groups, although with regard to C , there is a difference of opinion among respondents reflected, in the chi-square value of 12.78 significant at 5% level. This difference of opinion came from the larger percentage of agreement from the Bahraini and Omani respondents and could be attributed to the fact that these markets have not yet reached full maturity, some having reached a relatively better stage in their development than others.

Amongst general comments we have:

1) That certain accounting standards should be enforced in each sector of the market.

2) There should be a periodical investigation of the auditing offices while ensuring that the opinion manifested in the auditing offices reports is neutral.

3) International accounting standards are usually adopted by big companies and banks, but should be a requirement of all companies listed in the market.

Sixth, factor six regarding the need to increase the volume of information available on the market was broken down to three propositions and those propositions further broken down into sub-propositions.

Q6a) Corporation

Q6a1) Corporate financial statements should be improved

Q6a2) Management commentary in corporate reports should be increased.

Q6a3) Investment analyst contact with corporate management should be increased.

Q6b) Publishing Media:

Q6b1I) Daily newspapers should provide financial analysis of the market on a regular basis.

Q6b2) The number of business magazines both weekly and monthly should be increased.

Q6b3) There should be greater advertising of financial services.

Q6c) Other Published Financial Services:

Q6c1) Government agencies and officials do provide thorough financial information about the market.

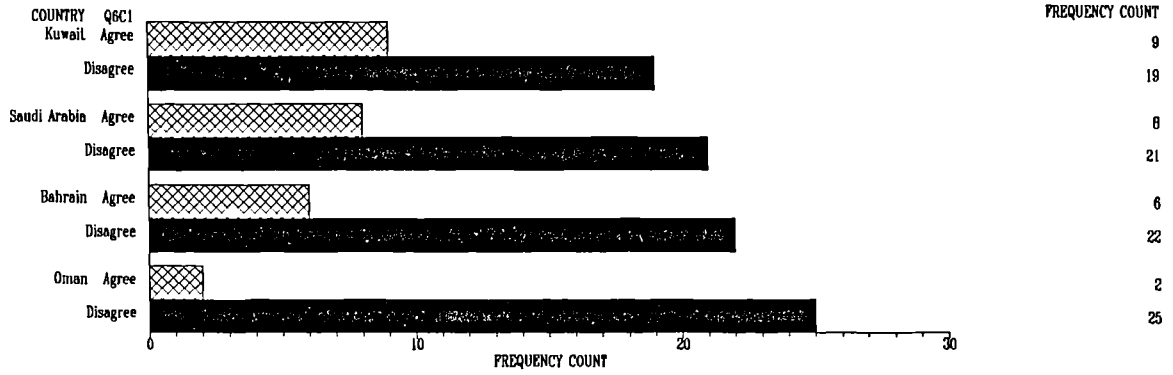
Q6c2) The current stock market analysis and dissemination of information is already sufficiently comprehensive and updated

The improvements reflected by the propositions above were widely agreed on by respondents - improvements regarding financial statements, management commentary in financial statements, investments analysis contacts, financial analysis in daily newspapers and increased number of business magazines and financial services publicised by companies. Such consensus is evidenced by the frequency which shows that 90% of the

responses were in accordance, while it is also clear from the insignificant value of the chi-square for proposition Q6a1, Q6a2 and Q6a3 that there is no differences in respondents' opinion from any country. However, Q6b1, Q6b2 and Q6b3 have chi-square values that are significant at 5% level and that is due to higher percentage of agreement by Kuwait and Saudi responses. Also, differences in opinion in Q6b2 is due to higher percentage of agreement in Kuwait and Oman, further differences in opinion in Q6b3 is due to responses of Kuwait and Bahrain. In regard to sufficient information being provided by the stock market and by the government authorities as in proposition Q6c1 and Q6c2, opinion shows that government agencies do not supply enough information to interested individuals and the stock market as the mainly public source of information does not supply sufficient updated analysis about the performance of traded companies. This can be seen from the disagreement of over 77% and 80% respectively, while the chi-square has a low value, indicating no differences of opinion between the groups as shown by table No. 4.2. Figure No. 4.2 also shows Qb1 that is the dissemination of information by government (e.g. stock market).

Indeed, notable dissatisfaction was manifested regarding the fact that insufficient information is provided by the stock market, together with insufficient reports concerning traded companies. The obligation is seen to provide more analysis and dissemination of information to all participants of the market with an emphasis on the regular updating of information and reports.

Figure No. 4.2: Dissemination of information by Government Agencies.



Let us now move on to the seventh factor regarding the transaction costs of the traded shares on the market. This was broken down into two propositions:

Q7a) There is a need to reduce the rate of commission charged by stock brokers.

Q7b) The size of the share prices' spread available in the market is wide in comparison with other markets.

The first proposition Q7a which suggests the need to reduce the rate of commission charged by stock brokers, is not, supported by the majority of respondents, this is evidenced by over 73% of responses disagreeing, with no difference of opinion from one country to another as indicated by the insignificant value of the chi-square. Regarding the size of the share prices' spread available in the market as in proposition Q7b, and as shown in table No. 2 , it is seen that 69.64% do not approve of the existence of wide share price spread. The chi-square statistic has relatively high significant value of 15.132 significant at 5% level, this indicating differences of opinion between the group of respondents with regard to difference of the spread of share prices from one market to the other.

There is more disagreement from Kuwait and Bahrain 78.57% and 92.86% respectively in comparison to 51.72% and 55.56% of Saudi Arabia and Oman.

The eighth factor discussed is the need for specialised financial institutions and new financial instruments based on each market stage and need. The factor was divided into two propositions with one sub-propositions for each.

Q8) The importance of specialised financial institutions to complement the function of the stock market.

Q8a1) The need for investment banks.

Q8a2) The need for market makers.

Q8a3) The need for unit investment trust.

Q8a4) The need for lessening of time for settlement.

q8a5) The need for clearing houses.

Q8b) The availability of a range of financial instruments and methods of trading gives investors a better chance of choosing their own portfolio.

Q8b1) The need for convertible bonds.

Q8b2) The need for short selling.

Q8b3) The need for margin account.

Q8b4) The need for an option market.

Q8b5) The need for preferred stocks.

We can see from the table No 4.2 that the need for an investment bank (Q8a1), unit trust (Q8a3) and clearing house obtained (Q8a5) 89%, 86% and 68% of response with the chi-square of low value resulting no difference of opinion between groups of respondents. 77% of respondents manifested the need for a market maker (Q8a2) with a difference among group opinion as can been seen from the high value of the chi-square statistic of 19.094 significant at 5% level because of low agreement by the Omani respondents of 51.85% in comparison with other group responses. Additionally, the need for lessening the settlement time (Q8a4) supported by over 67.86% of the respondents with a difference of opinions as can clearly be seen from the high value of 12.586 of the chi-square significant at 5% level came from the more agreement of the Saudi respondents which tells differences of immediate need for improving the settlement process in each market.

In section B, propositions regarding the need for convertible bonds (Q8b1) and an option market (Q8b4) reveal an agreement of 88.39% and disagreement of over 66.96% of responses with no significance value of the chi-square statistic to indicate that there is no difference of opinion among group respondents. On the other hand, the need for short selling, margin account, and preferred stock scores a disagreement responses of over 52%, 55% and an agreement of 65.18% with high chi-square values of 14..86, 14.67 and 10.75 significant at 5% level to indicate the presence of some difference of opinion among group of respondents The differences of opinion in propositions Q8b2 and Q8b3, the need for short selling and margin account, are due for the less percentage of disagreement Kuwaiti respondents. The less percentage of agreement from Saudi Arabia and Bahrain is the cause for the difference of opinion among the responding groups.

We notice that short selling, margin account has not taken an aggregate agreement in the market of Saudi Arabia, Oman and Bahrain, while it was, however supported in the Kuwaiti market. Further, the suggestion of having an option market was not heavily supported by interviewees' responses in the four markets and caution was raised that it might be misused by increasing the speculation. General comments related to this factor were:

1) All items suggested are all important.

2) Those items specifically suggested in section B of factor seven are available on other international markets but to adopt them in these markets would require sufficient time for these markets to reach more stability and maturity.

3) There should be depository system.

The ninth factor concerns the return available on the investments on the market. It was broken down into three propositions.

Q9) The return available on investments on the market.

Q9a) The return offered in the equity market is low.

Q9b) Government subsidies affect the return in certain sectors of the market.

Q9c) The size of government ownership has an effect on the return of some companies traded in the market.

Table No. 4.2 shows that there is over 77% disagreement regarding that the low return offer in comparison with other markets, with no difference among respondents indicated by the low value of the chi-square of 5.10.

Concerning the propositions that government subsidies affect the return of the traded companies, agreement percentages amounted to 88.39%, with corresponding chi-square value 11.50 significant at 5% level showing that there is some difference among respondents coming from the slightly less percentage of agreement (71.43%) of the Saudi responses. Finally, the suggestion that the size of government ownership has an effect on the return of some traded companies got a 77.68% agreement, with a difference among respondents from of each country indicated by the chi-square value of 18.49 significant at 5% level as shown by table No. 2 and that is shown by the less percentage of agreement 50% from the Bahraini responses.

Responses do not show that the market return on average is low compared, to the return on equity on other markets. Opinion regarding government subsidies shows that these have an effect on the return of the company either positively or negatively which could show that the company is profiting when it is actually doing otherwise (e.g. those companies that are subsidised with a fixed quota). Opinions indicated that the large number of shares owned by the Government in any company has an effect in the performance of the company, especially when it comes to the appointment of executives who usually do not offer a competitive performance compared to the private sectors.

4.4.2.2 Analysis by Occupation:

The last section the analysis of data by country category was discussed in details and we move to analyse our data by job category. The category of job includes: brokers, fund managers , market regulators, private investors and other as described in the introduction of data analysis. This discussion will not list the factors' propositions, instead we carry on by

listing the proposition code, for example Qa1 refers to "To further develop the market, we need to increase the number of companies currently operating in the market", and so on.

Looking at table No. 4.3, we notice that respondent opinion reflect a major agreement to propositions of factor one Q1a, Q1b, Q1c, Q1d, Q1e and Q1f without any difference between the group categories. The exception is proposal Q1f. The difference of opinion between the groups can be seen from the value of the chi-square 9.25 which is significant at 5% level. This is attributed to the private investor category whose agreement is only 41.67 % in comparison to other categories. Private investors do not agree that indirect ownership ownership of shares is the path to development. There is major disagreement with proposition Q1g confirming that all groups are in favour expanding the market.

Factor two propositions Q2a, Q2b and Q2c have a majority in agreement without noting any difference between occupational groups as indicated by the low value of chi-square test.

Factor three has two proposition Q3a and Q3b. There is a majority of agreement 86.61% to Q3a, whereas Q3b has a majority of disagreement. Both propositions have no difference among the opinion of the responding groups as shown by the value of the chi-square value in table No. 4.3.

In regard to factor four and factor five and their propositions Q4a ,Q4b, Q5a, Q5b and Q5c have a majority of agreement of 84.82%, 92.86, 83.04, 93.75 and 84.82. We find also there are not any differences in opinion with regard to these propositions.

In regard to factor six that have three propositions and their sub-propositions . We find that Q6a1, Q6a2, Q6b1, Q6b2, Q6b3 have a major agreement from respondents of each of job group whereas propositions Q6c1 and Q6c2 are majorly disagreed by respondents. All propositions have no differences among the group of respondents except proposition Q6c2 which due to the complete disagreement of the group of fund manager (100 %) and the lesser disagreement of 60% in comparison with the disagreement of other group.

Turning to factor seven, we find that the proposition Q7a and Q7b a majority disagreed 73.21 % and 69.64 % respectively by the group of respondents.

Factor eight as it is divided to two proposition with sub-propositions, there can be seen these which majority agreed by respondents Q8a1, Q8a2, Q8a3, Q8a4, Q8a5 and Q8b1. On the other hand, there are these that are with great disagreement Q8b2, Q8b3, Q8b4 and Q8b5. The only proposition with difference of opinion between the group of respondents is proposition Q8b3 and that is attributed to the less disagreement 37.50% obtained from the broker group in comparison with other percentage of disagreement obtained from other group.

Finally, factor nine has disagreement of 77.68% to the proposition Q9a and a majority of agreement of 88.39% and 77.68% to propositions Q9b and Q9c. The job groups of factor nine have no difference of opinion in relation to the suggested propositions as can be evidenced by the low value of the chi-square value shown in table No. 4.3.

Table No. 4.3: Analysis of Responses by Occupation.

Proposition	% Agree	% Disagree	Chi X^2 value	Chi X^2 Prob	Broker	Fund Manager	Market Regulator	Private Investor	Other
Q1A	89.29	10.71	4.845	0.304	87.50	91.67	85.00	75.00	95.45
Q1B	94.64	5.36	2.984	0.560	91.67	100.00	90.00	91.67	97.73
Q1C	67.86	32.14	5.008	0.287	66.67	91.67	70.00	50.00	65.91
Q1D	86.61	13.39	7.441	0.114	87.50	100.00	80.00	66.67	90.91
Q1E	73.21	26.79	1.811	0.770	66.67	75.00	70.00	66.67	79.55
Q1F	72.32	27.68	9.253	0.055	87.50	66.67	80.00	41.67	70.45
Q1G	16.07	83.93	0.704	0.951	16.67	16.67	15.00	8.33	18.18
Q2A	87.50	12.50	4.391	0.356	91.67	100.00	90.00	75.00	84.09
Q2B	98.21	1.79	5.566	0.234	100.00	100.00	95.00	91.67	100.00
Q2C	66.96	33.04	2.179	0.703	62.50	66.67	80.00	58.33	65.91
Q3A	86.61	13.39	7.075	0.132	79.17	100.00	75.00	83.33	93.18
Q3B	46.43	53.57	1.829	0.767	45.83	50.00	40.00	33.33	52.27
Q4A	84.82	15.18	1.488	0.829	87.50	83.33	90.00	75.00	84.09
Q4B	92.86	7.14	2.635	0.621	87.50	91.67	100.00	91.67	93.18
Q5A	83.04	16.96	5.617	0.230	87.50	91.67	90.00	91.67	72.73
Q5B	93.75	6.25	2.437	0.656	91.67	100.00	95.00	100.00	90.91
Q5C	84.82	15.18	5.019	0.285	79.17	91.67	90.00	66.67	88.64
Q6A1	94.64	5.36	3.836	0.429	95.83	83.33	95.00	100.00	95.45
Q6A2	95.54	4.46	4.269	0.371	95.83	100.00	100.00	100.00	90.91
Q6A3	90.18	9.82	1.411	0.842	87.50	83.33	95.00	91.67	90.91
Q6B1	90.18	9.82	2.163	0.706	87.50	100.00	90.00	83.33	90.91
Q6B2	95.54	4.46	3.470	0.482	100.00	91.67	100.00	91.67	93.18
Q6B3	91.07	8.93	7.429	0.115	100.00	83.33	95.00	100.00	84.09
Q6C1	22.32	77.68	7.309	0.120	20.83	16.67	40.00	0.00	22.73
Q6C2	19.64	80.36	9.310	0.054	16.67	0.00	40.00	8.33	20.45
Q7A	26.79	73.21	1.599	0.809	20.83	33.33	20.00	33.33	29.55

Q7B	30.36	69.64	4.862	0.302	45.83	16.67	20.00	33.33	29.55
Q8A1	89.29	10.71	2.208	0.698	83.33	83.33	95.00	91.67	90.91
Q8A2	77.68	22.32	2.503	0.644	79.17	75.00	90.00	75.00	72.73
Q8A3	86.61	13.39	4.926	0.295	75.00	83.33	95.00	83.33	90.91
Q8A4	67.86	32.14	7.123	0.130	70.83	50.00	75.00	41.67	75.00
Q8A5	68.75	31.25	3.362	0.499	62.50	83.33	80.00	66.67	63.64
Q8B1	88.39	11.61	6.810	0.146	91.67	100.00	90.00	100.00	79.55
Q8B2	47.32	52.68	3.686	0.450	45.83	58.33	35.00	66.67	45.45
Q8B3	44.64	55.36	9.150	0.057	62.50	58.33	40.00	58.33	29.55
Q8B4	33.04	66.96	6.439	0.169	54.17	25.00	25.00	33.33	27.27
Q8B5	65.18	34.82	7.253	0.123	87.50	50.00	60.00	58.33	61.36
Q9A	22.32	77.68	4.233	0.375	20.83	0.00	25.00	25.00	27.27
Q9B	88.39	11.61	4.594	0.332	100.00	83.33	85.00	91.67	84.09
Q9C	77.68	22.32	6.938	0.139	75.00	100.00	65.00	91.67	75.00

4.4.2.3 Analysis by Years of Experience:

We further continue our analysis of the data by doing an analysis of the years of experience, these are grouped into three groups: under three years, between 3-7 years and more than 7 years. We shall examine each factor of the ten factors separately as shown in table No. 4.4.

Factor one, we see that the majority of the three group responses in favour of the propositions: Q1a, Q1b, Q1c, Q1d, Q1e. Also, we see that respondent are in favour of the propositions mentioned as shown by their disagreement to Q1g that there is no need for these propositions. The chi-square values of the propositions: Q1c, Q1d, Q1e, and Q1f significant at 5% level show there are differences between their responses. The less agreement in responses of the category under three did make up the difference on opinion to these proposition

Turning to the factor two, there is a majority of agreement to the proposition: Q2a, Q2b and Q2c with the low values of the chi-square supporting that there is no difference in opinion among respondents.

In regard to factor three, we find first that there is a majority of agreement to the proposition of Q3a and Q3c represented by 86.61% and 84.82%. Proposition Q2b has 53.57% of disagreement by the response of the three groups.

Factor four has the two propositions Q4a and Q4b and Factor five has the propositions Q5a, Q5b and Q5c. The responses for these propositions have a major agreement of more than 80% from respondents and their low chi-square values no difference between groups responses.

Concerning factor six, there is a major agreement represented by more than 90% to the propositions: Q6a1, Q6a2, Q6a3, Q6a4, Q6a5, Q6b1, Q6b2, Q6b3. In contrast, we have a disagreement of more than 77% to the propositions Q6c1 and Q6c2. As shown by the low chi-square values in table No. 4, there are not any differences in opinion among the respondents.

Factor seven has two propositions Q7a and Q7b, both these propositions have more than 70% of disagreement by respondents. It is also noticed that there is no difference on the group opinion with regard to these two propositions as indicated by their chi-square values.

Factor eight has two set of opinion. The first is the major agreement of respondents represented by more than 65% with regard to propositions: Q8a1, Q8a2, Q8a3, Q8a4, Q8a5, q8b1 and Q8b2. The second is the disagreement opinion to propositions: Q8b2, Q8b3 and Qb4 with percentage of agreement of more than 52%. There is no differences of opinion with regard to these proposition as can be seen by the chi-square values from table No. 4.4.

Finally, in analysing factor nine 'the return available on the investment on the market" we see that there is an disagreement of 77.68% to Q9a but propositions Q9b Q9c have an agreement of 88.39% and 77.68%. The three group: under three years, 3-7 years and more than 7 years do not have differences of opinion in regard to these propositions as can be read from the chi-square value from table No. 4.4.

In summary years of experience does not explain differences in responses except for Q1c, Q1d and Q1f where younger market participants are less in agreement than the more experience.

Table No. 4.4: Analysis of Responses by Years of Experience

Proposition	% Agree	% Disagree	Chi X^2 Value	Chi X^2 Prob	Under 3-7 (Agree)	3-7 Years (Agree)	More Than 7 Years (Agree)
Q1A	89.29	10.71	2.855	0.240	95.00	92.16	82.93
Q1B	94.64	5.36	2.855	0.240	90.00	92.16	100.00
Q1C	67.86	32.14	10.506	0.015	40.00	78.43	68.29
Q1D	86.61	13.39	10.729	0.005	65.00	88.24	95.12
Q1E	73.21	26.79	6.692	0.035	50.00	78.43	78.05
Q1F	72.32	27.68	9.263	0.010	45.00	76.47	80.49
Q1G	16.07	83.93	0.297	0.862	20.00	15.69	14.63
Q2A	87.50	12.50	1.862	0.602	95.00	88.24	82.93
Q2B	98.21	1.79	2.205	0.332	95.00	100.00	97.56
Q2C	66.96	33.04	0.535	0.765	60.00	68.63	68.29
Q3A	86.61	13.39	1.090	0.580	85.00	90.20	82.93
Q3B	46.43	53.57	0.747	0.688	40.00	45.10	51.22
Q4A	84.82	15.18	0.937	0.626	80.00	88.24	82.93
Q4B	92.86	7.14	1.466	0.480	90.00	96.08	90.24
Q5A	83.04	16.96	2.474	0.290	95.00	80.39	80.49
Q5B	93.75	6.25	3.217	0.200	85.00	96.08	95.12
Q5C	84.82	15.18	1.539	0.463	80.00	82.35	90.24
Q6A1	94.64	5.36	2.730	0.255	95.00	98.04	90.24
Q6A2	95.54	4.46	0.065	0.968	95.00	96.08	95.12
Q6A3	90.18	9.82	4.504	0.105	90.00	84.31	97.56
Q6B1	90.18	9.82	0.487	0.784	90.00	92.16	87.80
Q6B2	95.54	4.46	2.203	0.332	90.00	98.04	95.12
Q6B3	91.07	8.93	2.650	0.266	95.00	86.27	95.12
Q6C1	22.32	77.68	2.275	0.321	10.007	23.53	26.83
Q6C2	19.64	80.36	1.436	0.488	10.005	21.57	21.95
Q7A	26.79	73.21	4.723	0.094	45.007	19.61	26.83
Q7B	30.36	69.64	2.473	0.290	45.007	27.45	26.83
Q8A1	89.29	10.71	2.341	0.310	80.002	90.20	92.68
Q8A2	77.68	22.32	3.986	0.136	75.000	70.59	87.80
Q8A3	86.61	13.39	3.633	0.163	75.002	86.27	92.68
Q8A4	67.86	32.14	0.838	0.658	65.003	64.71	73.17

Q8A5	68.75	31.25	0.255	0.880	70.005	70.59	65.85
Q8B1	88.39	11.61	1.088	0.580	95.000	86.27	87.80
Q8B2	47.32	52.68	2.931	0.231	30.008	50.98	51.22
Q8B3	44.64	55.36	1.124	0.570	50.002	39.22	48.78
Q8B4	33.04	66.96	1.051	0.591	30.008	29.41	39.02
Q8B5	65.18	34.82	2.426	0.297	80.009	60.78	63.41
Q9A	22.32	77.68	6.667	0.036	25.005	11.76	34.15
Q9B	88.39	11.61	0.578	0.749	90.00	90.20	85.37
Q9C	77.68	22.32	3.440	0.179	80.00	84.31	68.29

* Significant at 5% level.

4.4.3 Section Three

In section three, respondents from each market were asked to rate the ten proposed statements, that were mentioned in the previous section in this chapter as obstacles to growth and investment. The rating starts with number one as very important and number ten as least important. The question was given as follow:

'Please number the following statements according to their degree of importance. The most important item should be numbered 1, the next most important numbered 2 and so on...'

1) **The need to increase the size of the market.**

2) **The need for investors to be aware of investment available.**

3) **The need to update and maintain the legal frame-work in the market.**

4) **The need to reduce the importance of the insider information by regulation.**

5) **The need to improve current accounting standards**

6) **The need to increase the volume of information available in the market.**

7) **The need to reduce the transaction costs associated with .**

8) **The need for new financial instruments.**

9) **The need for specialise financial institutions**

10) Return offered on investments available on comparison with other equity markets.

Table No. 4.5 shows the mean of the responses for each factor, analysed for each country. The mean response gives the rank order of importance of each statement.

Our analysis of the mean score for each factor is produced in three tables: by country, by job and by years of experience. The factors is according to their mean. The smaller the factor mean the more important the score the factor, since the rating scale runs 1...10 with 1 the most important, and 10 the least.

4.4.3.1 Analysis by Country

We proceed first by analysing the mean score by country as shown in the table No. 4-5. This data is diagramatically represented in figure No. 4.3:

Table No. 4.5: Ranking of Importance by Country

Kuwait

1	2	3	4	5	6	7	8	9	10
2.654	3.462	4.038	4.308	4.731	5.615	6.038	6.346	8.462	9.077
one	nine	four	eight	six	two	five	three	ten	seven

Saudi Arabia

1	2	3	4	5	6	7	8	9	10
2.655	4.172	4.448	4.724	5.414	5.655	6.069	6.103	7.552	8.379
one	three	two	six	five	four	eight	nine	seven	ten

Bahrain

1	2	3	4	5	6	7	8	9	10
2.571	4.321	4.357	4.714	5.357	5.607	5.893	5.964	7.857	8.179
one	two	six	nine	four	five	three	eight	seven	ten

Oman

1	2	3	4	5	6	7	8	9	10
1.640	2.640	4.440	4.560	4.760	5.160	6.640	7.640	8.560	8.920
two	one	nine	six	four	five	eight	three	ten	seven

**1...10on= 1 is the most important and so on.*

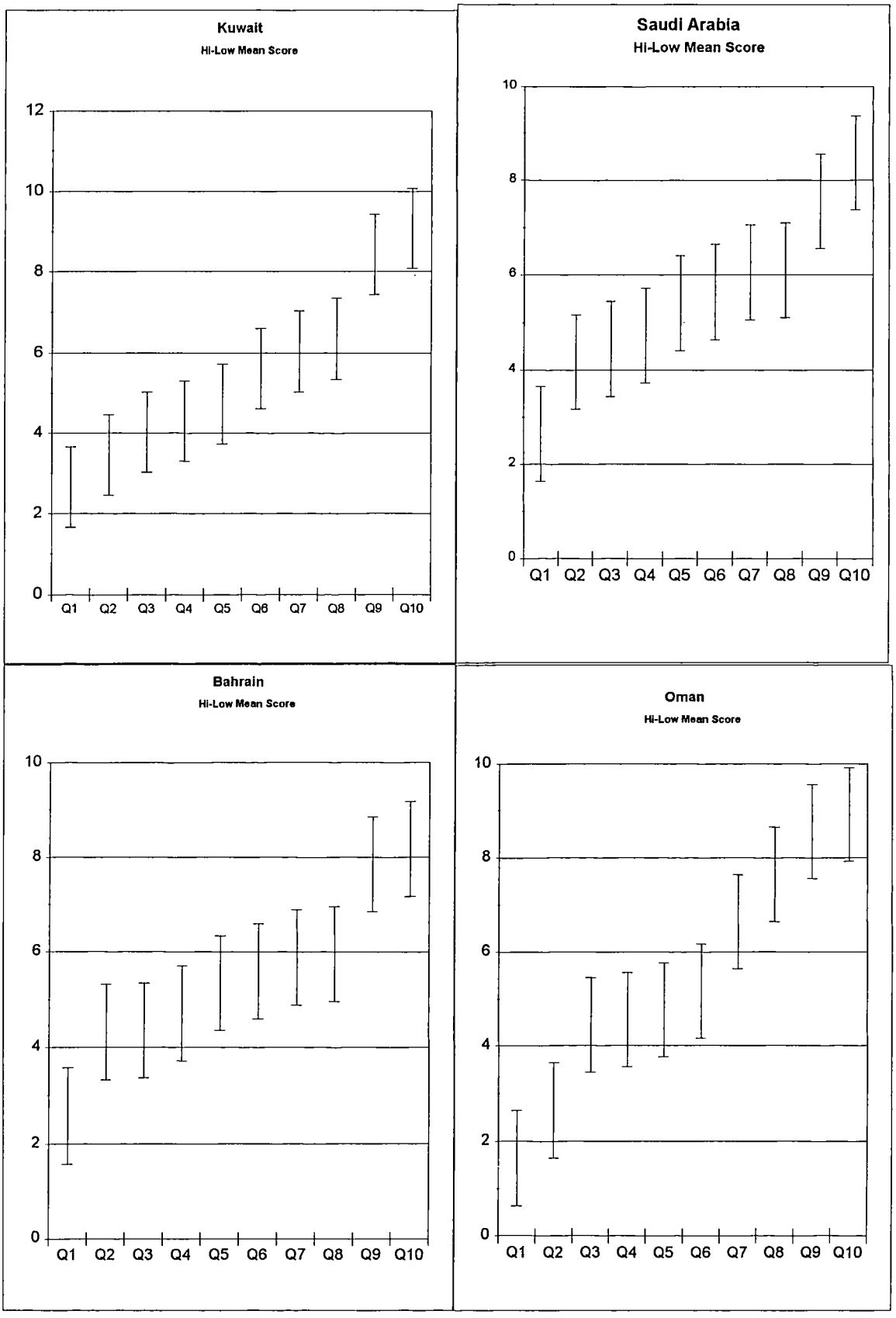
+The less the number the more important for example 2.654 for the Kuwait catagory is the most important

++is the factors ranking for example, one is denated to factor one.

There is not much agreement among respondents regarding to the importance of these statements in any of the four markets, except for the statement numbers 1,7, and 10. The average respondents' opinion is close regarding the need to increase the size of the market. This is an important factor. The need to reduce transaction costs and also the statement of the return offered on investments available in comparison with other markets are regarded the least important and the analysis by country reveals consensus on this.

Let us now look more closely at the figures regarding the first consideration - the need to increase the size of the equity market - Kuwait, Saudi Arabia and Bahrain rank this the most important, with only slight difference observable in the opinion of respondents from Oman, who ranked the consideration an average second. Both statements number seven and ten obtained a close score rating of them of little importance an average in positions, nine and ten.

Figure 4.3: Analysis by Country



Opinion relating to other statements varies in importance in all the four markets and that , in our opinion, is influenced by the current stage of the development of markets and their structure. We notice then in Saudi Arabia that the statement concerning the need to update and maintain the legal framework was given an importance rating of second, whereas in other markets the opinion score given ranged between seven and eight place. According to our opinion, this is due to the fact that organisation and structure need to be further developed in the market. The rating given by Oman reflected concerns for the need for investors to be aware of investments available on the market. The reason, is the market has only recently been established (June 1989). Trading was not common-place activity before that as was the case in relation to Kuwait and to a lesser extent in Bahrain before they established their stock markets. The third observation, in Kuwaiti respondents awarded a rating of second place to seeing current need for financial intermediaries. The reason for this is that the Kuwait stock market is the oldest in the Gulf region which makes somewhat more stable, requiring the existence of more participants and players on the stock market.

4.3.3.2 Analysis by Occupation

Second, we analyse the responses by occupation as the table below shows:

Table No. 4.6: Ranking of Importance by Occupation

Broker

1*	2	3	4	5	6	7	8	9	10
2.708+	3.625	4.667	4.917	5.042	5.417	5.625	6.208	8.417	8.875
one++	two	six	nine	four	eight	three	five	seven	ten

Fund manager

1	2	3	4	5	6	7	8	9	10
2.583	3.667	4.250	4.667	5.417	5.417	5.583	5.583	8.417	8.833
one	nine	two	four	five	six	three	eight	ten	seven

Market regulator

1	2	3	4	5	6	7	8	9	10
2.650	3.850	4.350	4.500	4.850	5.400	6.050	6.050	8.450	8.650
one	nine	two	six	four	five	three	eight	ten	seven

Private investor

1	2	3	4	5	6	7	8	9	10
2.333	3.250	3.917	4.667	4.833	5.667	6.500	7.083	7.917	8.417
one	two	six	nine	four	five	eight	three	seven	ten

Other

1	2	3	4	5	6	7	8	9	10
2.568	4.068	4.523	5.159	5.250	5.318	5.659	6.000	8.159	8.182
one	two	six	nine	four	five	eight	three	seven	ten

**1...10on= 1 is the most important and so on.*
+The less the number the more important for example 2.708 for the the broker catagory is the most important
++is the factors ranking for example, one is denated to factor one.

Respondents opinion - as they are categorised by occupation - is similar to statement 1: the need to increase the size of the market. Respondents rated this statement to be the most important out of the ten because they see increasing the size and trading of the market by the ways of: increasing the number of companies, allowing the GCC and non-GCC for more direct ownership.

Pursuing with statement 2, we see that broker, private investor and other have a rank of 2, whereas fund manager and market regulator have given a rank of 9. It is thought that the market had passed the initial stage so the market regulator had score this statement to be the least important. This view is shared by private investor who usually aware of the market activities and are frequent participants in the market.

Respondents to statement 3 has have two different views. First, those of brokers, private investors and other with a mean reply of rank of 6 and second those who represent the view of fund manager and market regulator who gave average rank of 2. It is attributed because of the exposure of the fund manager to other market and the awareness of the regulator of recent development in the financial markets led to give a more important score o this in comparison with other group.

Statement four - the need to reduce the importance of the insider information has rank of 9th place given by broker, private investor and other and rank of 4th place and six given by 4 and 6 from fund manager and market regulator. The greater importance given by fund manager and market regulator, is because of the need first to have a firm market to maintain a local portfolio whereas it is important for the latter to reduce the importance of the insider information.

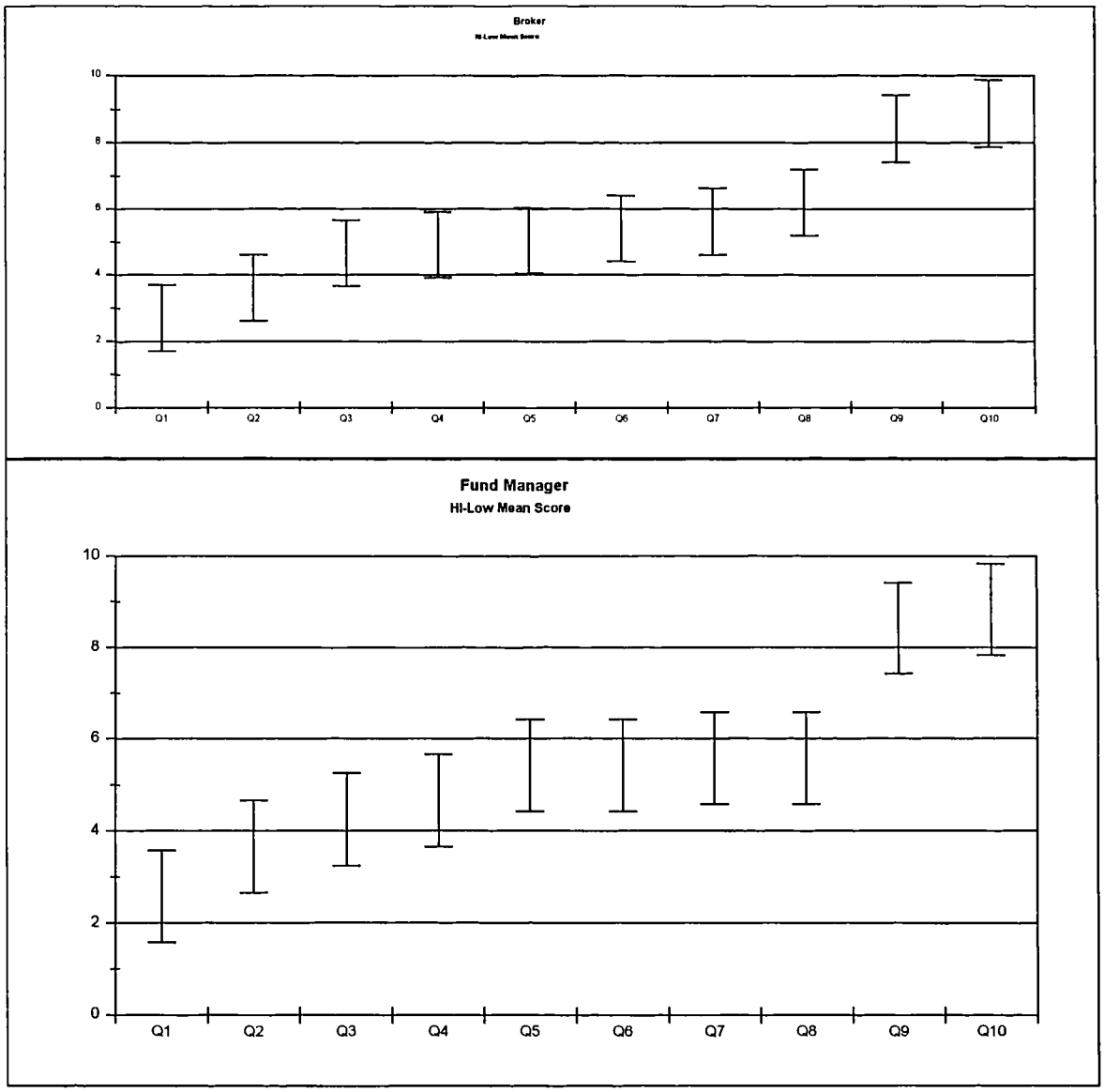
Looking closely at the score regarding the fifth statement, broker, market regulator, private investor and other gave an average rank of four with only slight difference observable on the opinion of fund manager who awarded the statement an average of 5 points on a 10 scale.

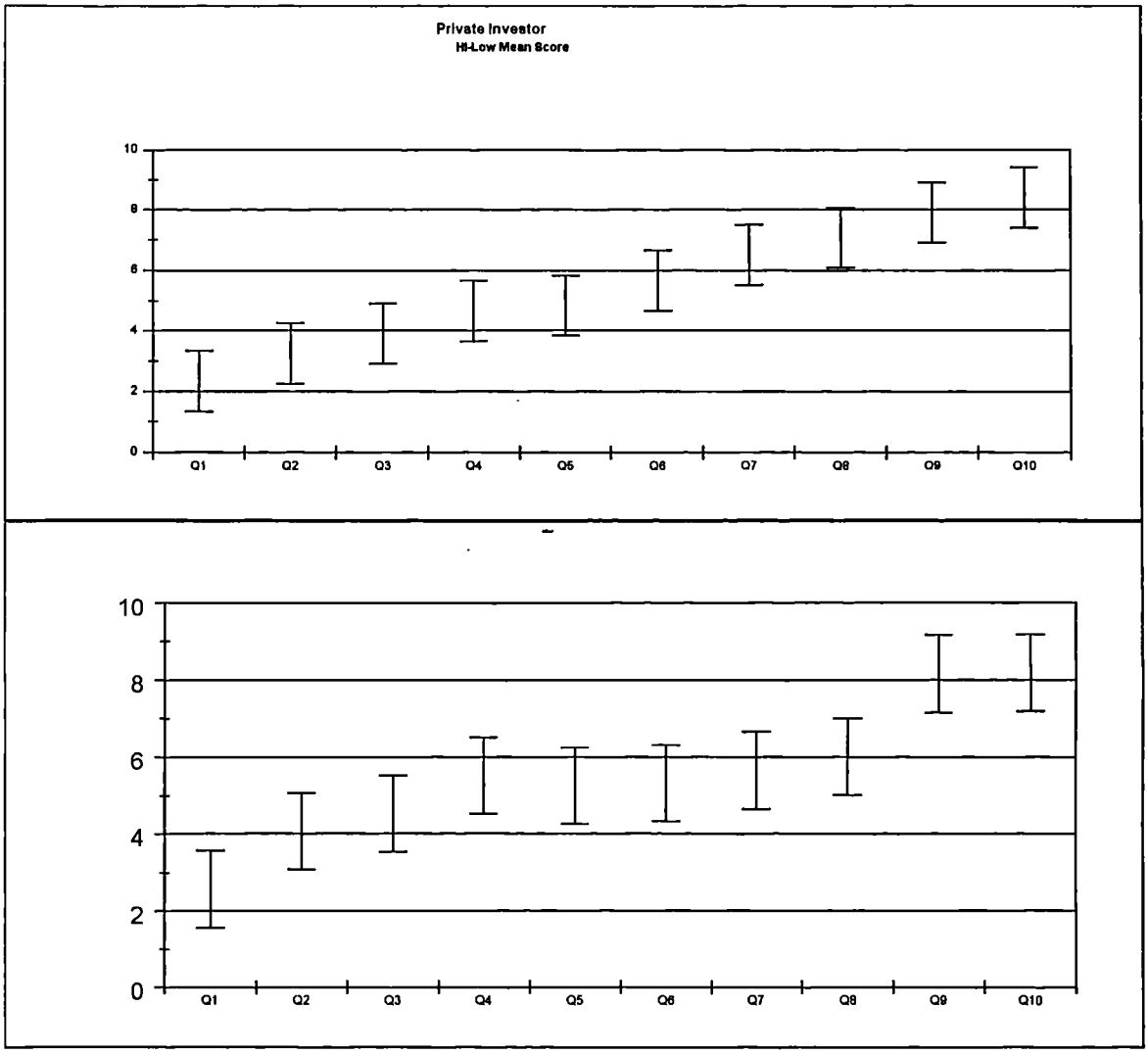
In regard to statement 6, we find that market regulator, private investor and other share similar view given an average of 5. On the other hand the broker and fund manager groups gave an average score of 8 and 6 to this statement respectively. This is not an important consideration.

Statement 7 was given an average of 3 by the broker group, fund managers and market regulators but only a score of 8 by private investor and other groups. Statement 8 is ranked 3 by private investor and other and 5 by broker. It is also ranked a score 8 by fund manager.

Both statement 9 and 10 were ranked either 7 or 10 as core of importance by different group. The figure below gives a comparison of the hi-low mean.

Figure 4.4 : A Comparison by Occupation




Private Investor
Hi-Low Mean Score
10
8
6
4
2
0
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
10
8
6
4
2
0
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10

4.4.3.3 Years of Experience:

Here we pursue by doing our analysis by years of experience of respondents as the table below shows:

Table No 4.7: Ranking of Importance by Years of Experience

Under three years

1	2	3	4	5	6	7	8	9	10
2.579	3.842	4.737	4.895	4.947	5.789	6.000	6.158	7.632	8.684
one	two	four	six	nine	five	three	eight	seven	ten

3-7 years

1	2	3	4	5	6	7	8	9	10
2.157	3.588	4.647	4.647	5.059	5.294	5.765	5.843	8.784	8.863
one	two	six	nine	five	four	eight	three	seven	ten

More than 7 years

1	2	3	4	5	6	7	8	9	10
3.024	4.415	4.488	4.561	4.927	5.512	6.098	6.220	7.732	8.122
one	six	two	nine	four	eight	five	three	ten	seven

**1...10on= 1 is the most important and so on.*
+The less the number the more important for example 2.579 for under three years catagory is the most important
++is the factors ranking for example, one is denated to factor one.

We can see that all the three categories: under three years, 3-7 years and more than 7 years have score the first statement a rank of one to give the most important one of the ten.

The next statement - the need for investors to be aware of investment available has obtained the score of second important by respondents of under three years experience and 3-7 years. The respondents of more than 7 years rated the statement 6.

The third statement obtained different scores by the three type of respondents. That is a rank of 4 by the group under three years and a rank of 6 by respondents from 3-7 years and a rank of 2 by respondents of more than three years.

The fourth statement concerning the insider information was given a rank of nine by both the first and the second group and could be interpreted that these two groups see this statement less important as compare to the others or regard the occurrence insider information is negligible on the market. The statement was ranked a score of 9 by the group of more than 7 years.

Turning to the fifth statement the first group rated it a rank of 9. A close rank of 5 and 4 were given by the groups of 3-7 years and more than 7 years.

The group with experience of work of more than 7 years has rated the need to increase the information - statement 6 - a rank of 8. which lead us to think this group think this statement is of a less important at the current stage of the market. Other groups gave a rate a rank of 5 and 4.

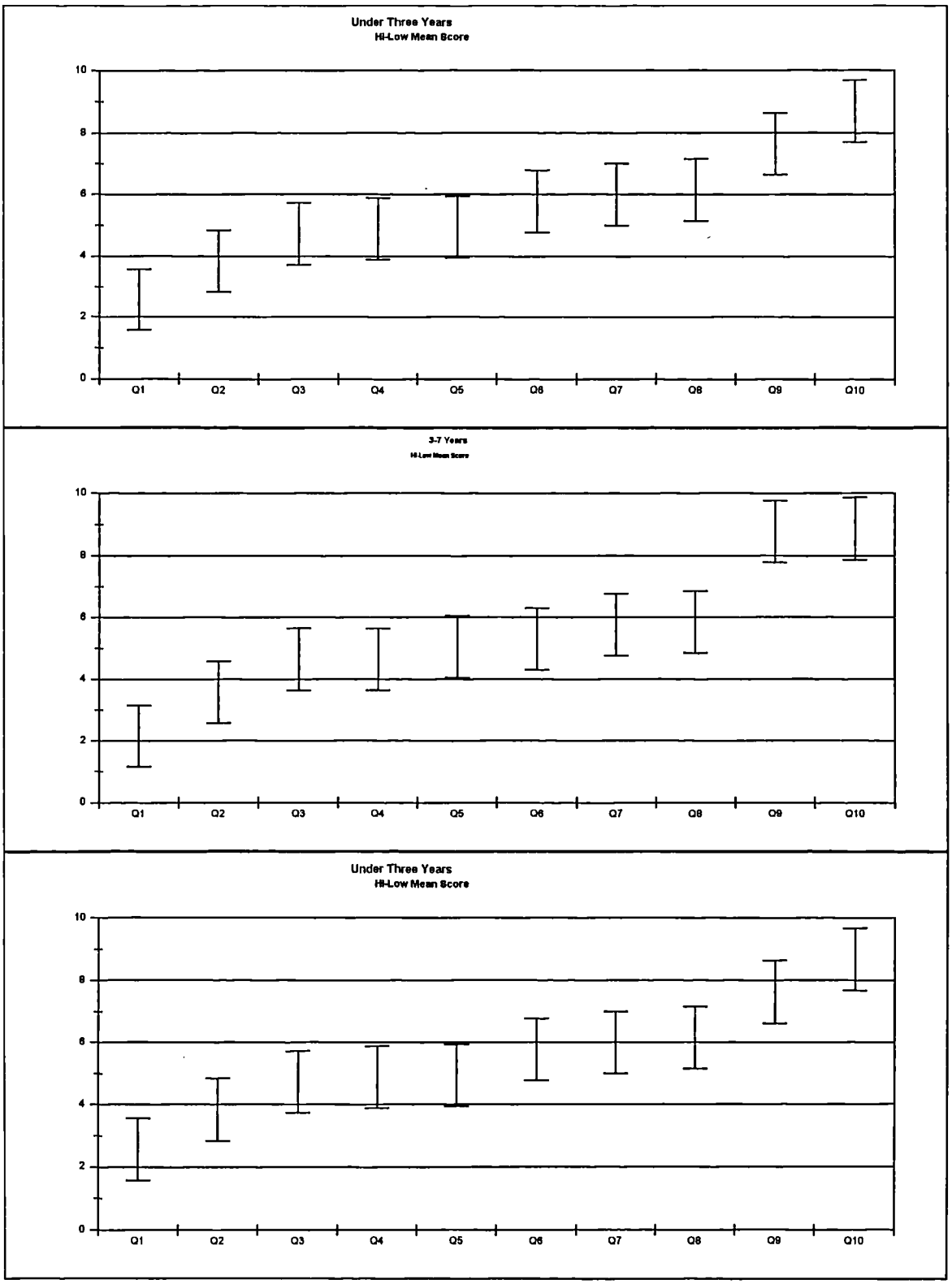
Statement 7 is ranked by the groups of under 3 years, 3-7 years and more than 7 years in places 3, 8 and 5 respectively.

Statement 8 obtained the rank of 3 by both the respondents of work experience of 3-7 years and more than 7 years. to reflect the opinion of the two group of the market to have more financial instruments which all the markets lack at present. A rank of 8 was given by the group under three years.

Finally, statement 9 has rank of 7, 7, 10 by the groups respectively and statement 10 scored to be the least important - rated 10 - by the groups of under three years and 3-7 years. The group of more than 7 years gave a rank of 7 to statement 10.

Figure No. 4.5 below compares the responses by the years of experience:

Figure No. 4.5: Responses by Years of Experience



4.4.4 Section Four

In section four interviewees were asked to specify the main obstacles to the successful development of the gulf markets. The actual wording of the question was given as follows:

"There are many factors which make for a successful stock exchange. What do you consider to be the main obstacles to develop the gulf markets as important and successful stock exchanges.? please list?"

Our analysis of the answer to this question required that we group together similar view points from the four markets, while also listing other comments peculiar to themarket.

Responses:

1) Public participants on the stock market tend to hold their shares for a long period of time without following the changes that occur within a company which usually affect the shareholder position.

2) The need for security and confidence in the market. The security of the market was defined - disregarding crises similar to that in AL-Manakh, Kuwait.

3) The lack of a broad base of ownership on the market which is represented by the dominant family and government ownership of shares in the traded companies.

4) The need to up grade communication between each local market and other market at all levels.

5) Government authorities need to have a clear understanding of the role of the stock market and its importance to economic development and also to be aware of whether clear if the stock market is a listing agency, trading machinery or trading association.

6) The need to set a law which would encourage and help some important institutions to participate in the market to specified percentage.

7) The lack of experience by brokers which can be seen by the absence of detailed market reports, this necessitating a training programme.

8) Government authorities usually intervene in the market which can affect the normal performance of the market.

9) Some investors take religion into consideration when investing in shares in the stock market, avoiding the shares of some traded companies which deal with usury.

10) The performance of traded companies is very much effected by government programmes and projects that affect the economy. For instance, if the government were to spend more, that will positively affect the economic activities.

11) Rumours are of much significance when investors make their decisions to buy or sell shares.

12) The need to increase the numbers of companies.

13) There is a need for the updating of training programmes available for stock market employees, this will enhance administration skills and the dissemination of information.

14) The dominant environment is the one that demands the physical possession of securities and their presentation on settlement - hence the reason why securities can not be transferred by book-entry only.

15) The market lacks a central depository organisation.

16) The local stock markets should be open first to Gulf citizens and should be followed by Arabization and then internationlasition. Arabization means the opening up of the local stock markets to Arab Nationals and to investment funds from the Arabic Countries. Internalisation also means the opening of local stock markets to international investors either to individuals or to unit trusts.

17) To facilitate a harmonious relationship between local gulf stock markets, there is a need for the gradual amendment of local law and legislation to serve the purpose in the long run.

18) There is a need for specialised financial and economic newspapers and magazines to provide a whole and detailed analysis of the economy and the stock market.

4.5 Conclusion

The establishment of a stock market requires long-intensive research studies to come up with a model that can suit the need of the society. There are always alternatives, and finding the suitable alternative can effectively help the development of the economy.

The aim of this chapter has been to find out more about the special characteristics of the Gulf Markets, and there is indeed a lack of information about them in comparison to the structure of mature markets. For the first section of this chapter, we conducted survey-interviews on selected and defined categories of respondents from each market of the four markets. In the second section, our questions dealt with factors that are regarded as an obstacle to growth and investment in these markets. The findings show that there is general agreement on the consideration detailed in our questionnaire, comments arising from the open-ended questions shedding light on related problems. The third section, listed these factors proposed earlier in the second section, respondents from the respective countries were asked to rate according to importance. The importance of each factor as it was shown by our analysis, seems to vary from one country to another with the exception of three factors of the proposed ten: the need for increasing the size of the market, the need for reducing the transaction costs and the return offer on the markets in comparison with other markets. Their ratings can be

seen to be very close in terms of their importance. In the last section, respondents listed additional interesting obstacles.

The survey greatly enlightens us with regard to the improvements that are needed to be taken into consideration for each market, and which especially affect the improvement of the operation and efficiency of them. Such improvements will help these markets to achieve their goals in the process of the development process. These suggested improvements will raise further suggestions that will contribute to the efficiency of these markets and this will be covered in the conclusive chapter here together with implications for policy-making[3].

Notes of Chapter 4

[1] A special thanks to: Dr. Safak Al-Rekiabi, Bader Al-Somiat, Basel Al-Zaid, Khalifa Al-Jasem from Kuwait. Prince Faisal Al-Sedairi, Salman Al-Dokither, Amar Al-Ajmi from Saudi Arabia. Shiekh Ahmed Al-Khalifa from Bahrain. Mr. Mohamood Al-Jerwani, Salem Bin Mubarek and Mr. Nader Azar from Oman.

[2] The interviews were conducted during a series of vists to each country from June-July 1991, April-May 1992 and December 1992-January 1993.

[3] After the conducting of this survey and analysing it, it appeared that some of the suggestions raised in the survey have been adopted by these markets. For example, increasing the quata of ownership in each market to the other Gulf citzens and to foriegners in the markets of; Kuwait, Bahrain and Oman.

Chapter V: Data and Methodology

5.1 Introduction

This chapter starts by explaining the creation of the database for this study and it addresses problems encountered during the collection of the data. Second, it discusses the criteria and procedures used for choosing the sample studied for each market. The third section deals with the data transformation. Fourth, is the discussion of the methodology used to test the weak-form efficiency. Fifth, it discusses the method used for testing the anomalies of the weak-form. Finally, the last section discusses two methods used in this study for estimating the transaction costs.

5.2. Data Collection:

Research applied to developing markets encounters a major handicap of not having appropriate data in comparison with developed and mature markets. Databases are rare in these markets. This problem was solved first in the American markets with the Centre of Research in Securities Prices (CRSP) and then in the early seventies in the UK by the creation of London Business School data base. Data availability had the effect in increasing the volume of research.

For the research in the Gulf markets it was found that when data was obtained it was usually in manual office files. Either there is a lack of resources or there is not enough awareness of the importance of having data in machine readable format from the people who are working in the developing markets of the Gulf. The International Financial Corporation has

data on some developing markets, but still with limitations either in terms of length of the data series or lack of daily observations. The IFC database does not cover the Gulf stock markets. The only feasible way was to assemble the data sets by hand.

The closing share prices (weekly and daily) were obtained from Kuwait, Saudi Arabia, Bahrain and Oman . The period covered and source of information of the data used are as follows:

1) Kuwait Securities Market (Department of Public Relations), Kuwait City covering the period of January 1987 to July 1990[1].

2) Saudi Arabia Monetary Agency (Department of the Shares' Trading) Riyadh, covering the period of January 1987 to July 1992.

3) Bahrain Securities Market (Department of Public Relations) Manama, covering the period of January 1990 to December 1992.

4) Muscat Securities Market (Department of Public Relations) Muscat, covering the period of January1990 to December 1992.

The coverage period of Kuwait share prices data from January 1987 until July 1990, because of the invasion of the country after which the stock market did not operate until 28th of Septemebr 1992. Due to the recent opening of both Bahrain and Muscat Securities Markets a six month lapse was given to allow the period for development. The data used started from 1990 to allow time for running both markets and eliminating any administration problems. Also, enough time was given to the use of the newly automated trading system

which was established in1985 in the Saudi market, that the data used starts from January 1987.

The daily and weekly closing share prices, of the traded companies on the four markets, obtained were in sheets and in the Arabic language using Arabic numerals. That created a lot of difficulty in terms of translating these data and entering it manually into a computer readable files. This was especially for the data of Saudi Arabia which has a different calendar. Saudi uses the Hijra calendar which needed to be converted to Julian calandar. A code was given to each company and the same procedures were followed for each market. A data base was then created for each market separately (Kuwait, Saudi Arabia, Bahrain, and Muscat).

5.3. The Sampling of Data and Selection of Actual stocks:

After the creation of the data set, we restricted the sample of this study to:

1) Those companies that are actively traded on each market. In order to avoid as much as we can the problems characteristic of thin markets which is discontinuity in trading the companies chosen had to be traded for at least 30% of the total period selected[2]. Usually companies that are actively traded, are also with a large market capitalisation, thus the selection criterion is biased in favour of the large companies. However, if the market is found not to be efficient with respect to large companies then this is a powerful test.

2) Companies which are largely owned by the government are excluded from the sample on each of the included markets, because of the effect of the government on their financial performance.

3) Companies that received a subsidy from the government are also excluded for same reason as in 2.

4) These companies have to be traded before the period selected for our sample.

5) In addition to the above criteria preference was given to the the views of participants and analysts on the more important traded companies on the four equity markets.

Overall, the selection criteria produced a sufficient large sample biased towards privately owned, and large actively traded Gulf Companies.

5.4. Data Transformation

To avoid non-stationarity in raw share prices, previous researchers used either the changes in share prices or share returns. The daily and weekly returns of shares are calculated as follows:

$$R_{jt} = \frac{P_{jt} - P_{jt-1} + D_{jt}}{P_{jt-1}} \qquad (1)$$

Where

P_{jt} = closing share price of the company j at time t

P_{jt-1} = closing share price of company at time t - 1

D_{jt} = dividend per share paid at time t.

The actual testing of independence will be carried out using both the above calculation of returns and the logarithm transformation of share prices. The model in log form is as follows:

$$R_{jt} = \log P_{jt} - \log P_{jt-1} \qquad (2)$$

Many of the early studies have used log price transformation, for instance Fama (1965), Dryden (1974) and Jennergren and Korsvold (1974), Jennergren and Toft-Nielson (1984)and Eurunza and Iosq (1985). They all justified the use of logarithm for two reasons:

1) Absolute price changes suffer the disadvantage that they are to some extent dependant on the actual price level of the share, that is they are heteroscedastic.

2) The change in the natural logarithm of the price of a share is the yield with continuous compounding from holding that share over the period of time the change is measured and has a justifiable economic interpretation..

5.5 Adjustments of the Sample Data:

When the share goes dividend, it is assumed that the price will decline by the amount of dividend when other conditions stay the same. The adjustment of the prices will be:

Dividend:

$$u_{j,t+1} = \ln(p_{j,t+1} + D) - \ln p_{j,t.} \qquad (3)$$

Where: D is the amount of dividend per stock.

Stock Spilt:

In the case of the stock split the adjustment for the natural logarithm of prices is as follows:

$$U_{j,t} = \ln(p_{j,t+1} * 2) - \ln p_{j,t} \qquad (4)$$

The above is the adjustment of stock spilt two for one and when the split is declared on day t+1, its actual price on day t+1 is half.

Stock Dividend:

If the number of stocks increases at the rate 'n' by issuing stock dividends to offer the share ex-rights, the value of (1+n) shares on the day t+1 will be equal to that one share of the day t. Logarthmic prices difference can be adjusted as follows:

$$U_{j,t+1} = \ln(p_{j,t+1}(1+n)) - \ln p_{j,t} \qquad (5)$$

The returns transformations were thus adjusted for dividends, stock splits and stock or scrip dividends.

5.6 Methodology

To test whether successive differences in logarithm of stock prices are independent random variables, a number of statistical tests have been used in the literature [(Fama 1965), (Solink 1973)]. These tests tend to fall into two general groups. The first group applies miscellaneous statistical techniques to stock price changes or to changes to a suitable index of share prices to establish statistical independence. The second group tests stock market

trading rules, based on historical price data, to see whether it generate abnormal returns.

A number of parametric and nonparametric tests have been used by researchers in the literature to test for the anomalies of weak-form efficiency.

The statistical methods which will be employed in this study to test the weak-form of the efficient market are the serial correlation test and the runs test for independence. The normality of share prices will be tested. A regression test is used to find if there is anomalies effects (the day-of-the week effect). Also, two methods to estimate the effective bid-ask spread are used.

First, we will describe the random-walk that is tested by the independence tests and runs test.

5.6.1 The Random-Walk Model:

Fama (1965) stated that the random walk is that "The future path of the price level of a security is no more predictable than the path of a series of calculated random numbers"

The model is based on the assumptions:

1) The prices changes are independant, identically distributed random variables.

2) The distribution of price changes has finite variance.

The independence hypothesis is the most important and most investigated by the emprical research. That the price changes are independant conforms to the theory. The model is stated as follows:

$$P_{j,t+1} = P_{j,t} + \varepsilon_t \qquad (4)$$

where

$P_{j,t}$ = the price of a j th stock at time t

$P_{j,t+1}$ = the price of a j th stock at time $t+1$ and

ε_t = the residual

that is: $E(\varepsilon_t) = 0$

$$E(\varepsilon_t, \varepsilon_{t-k}) = \sigma^2_t, \text{ for } k = 0$$
$$= 0 \text{ for } k \neq 0$$

The variable focused in this study is not stock price itself but logarithmic stock price changes, which are approximately equal to the rate of return of corresponding stock, because investors are interested in the rate of returns and not stock prices per se. To accommodate the need of this study, it is necessary to modify the above simple random-walk model in logarithmic form.

The error term, ε_t, can be regarded as a price change between period t and period (t+1) in equation (1):

$$\varepsilon_t = P_{j,t+1} - P_{j,t} \qquad (5)$$

If $P_{j,t+1}$ and $P_{j,t}$ in equation (5) are transformed into logarithmic form, the error term, ε_t, becomes the rate of return of security j during the period between time t and time (t+1),

$$U_{j,t+1} = Ln(P_{j,t+1}) - Ln(P_{j,t}) \quad (6)$$

$$= Ln\{(P_{j,t+1}) / P_{j,t}\} \quad (7)$$

where

$U_{j,t+1}$ = the rate of return of security j during interval t+1,

$P_{j,t}$ = the price of the security j at the end of the period t

$P_{j,t+1}$ = the price of security j at the end of period t+1.

If the rate of return, $U_{j,t+1}$, is proved to be independently and identically distributed random variables with zero mean, the stock prices are to said to follow a random-walk model. The serial correlation test and run tests will be used to determine whether the variables, $U_{j,t+1}$, are independently distributed random variable with zero mean.

Test of Independence

The independence hypothesis is first investigated by studying the distribution of the first-order correlation coefficient for each security. As a method of investigating the intertemporal independence of stock prices is simply to estimate the correlation coefficient between successive price changes over a long period of time. Any serial correlation between successive price changes can be measured statistically by means of the correlation coefficient. If there is a trend on the share prices, the correlation coefficient will be positive on a scale between 0 and +1. If the price changes in the period tend to reverse the

changes in the preceding period, then correlation coefficient will range between 0 and -1. The value of the correlation coefficient will be almost zero when there is no trend. The serial correlation coefficient of a time series U_t is given by the autocorrelation function:

$$r_k = \frac{\text{Covariance}\,(U_t - U_{t-k})}{\text{Variance}\,(U_t)}$$

Where variable $U_t = LnU_{t+1} - LnU_t$.. Natural logarithms are used because Variance $(P_{t+1} - P_t)$ increases with P_t and P_t, $Var(U_t)$ does not. Given values n values $(U_1 U_2 ... U_n)$ the serial correlation coefficients of lag K $(K = 1,2,...n-1)$ is given by the following fromula:

$$r_k = \frac{\frac{1}{n-k}\sum_{t-1}^{N-K}(U_t - \bar{U})\ (U_{t+k} - \bar{U})}{\frac{1}{n}\sum_{t=1}^{n}\ (U_t - \bar{U})^2}$$

Where:

K= time lag

n= number of price changes

U_t= the price difference as mentioned on the last section.

$\bar{U}$= the mean = $\sum_{t=1}^{n} U_t / n$

When we calculated r_k , the standard error of sample serial correlation coefficients, r_k , may be computed as :

$$\sigma \approx \sigma\ (r_k) = 1/\sqrt{N-K} \qquad \text{(Kendall, 1948)}$$

If $(r_k) \leq 2(\sigma)$, then r_k is not significantly different from zero. A linear dependence among $U_t\ U_{t-k}$ when $(r_k) \succ 2\ (\sigma)$.

Whether the natural log stock price changes may actually have finite variance and therefore be normally distributed is questionable. Fama (1965), Dryden (1970) and Juttner (1973) have found the distribution of log price changes deviated from normality in the direction of leptokurtosis. Therefore, the formula above might not be a precise measure of the standard error of r_k. However, Fama (1965) argues that the serial correlation coefficient seems to be an effective tool in testing for serial independence when a large sample is used, even when the distribution of V_t has a possible infinite variance.

Runs Test:

The most straight-forward test for dependence is the runs test. A run is defined as a sequence of more than one price change of the same sign. For example, replacing the numerical value of price changes by a "+" when the change is positive, by "0" when there is no change, and by "-" when the change is negative, the sequence " ++0+--+++" consists of five runs. For given probabilities of a stock price increase or decrease, if positive changes tend to be followed by positive changes and negative changes by further negative changes, then the number of runs in a particular price series will be less than if the changes were independent. Similarly, if there is a tendency for positive changes to be followed by negative changes, and vice-versa, then the number of runs will be greater than if changes are independent. The weak form of the efficient market argues that the price changes from period to

period are independent of each other, i.e., random. Essentially, these test attempts to find out whether a series of price changes is distributed randomly over time. The run test is as follows[3]:

$$m = \left[N(N+1) - \sum_{i=1}^{3} n_i^2 \right] / N \qquad (10)$$

Where N is the total number of observations (changes in stock prices) and the n_i are the number of price changes of each type, with $i = 1,2,3$ representing the total number of positive, negative (-) and zero (0) stock price changes.
The variance of m is

$$\sigma_m^2 = \left(\frac{\sum_{i=1}^{3} n_i^2 \left[\sum_{i=1}^{3} n_i^2 + N(N+1) \right] - 2N \sum_{i=1}^{3} n_{i=1}^3 - N^3}{N^2(N-1)} \right)^{1/2} \qquad (11)$$

For large N, the sampling distribution of m is approximately normal. The standardized variable may be determined as

$$Z = \frac{(R+0.5) - m}{\sigma_m} \qquad (12)$$

where R is the actual number of runs.

5.6.2 Distributions Statistics:

Tests of the random walk hypothesis as a second order martingale do not require that price changes conform to a specific distribution. All that is required is that the distribution displays a finite variance.

The return next period on a stock is not known and it can be thought of as being a random variable. In other words, the return can be properly considered as a variable whose observed value is governed by a probability distribution. In statistical terms, returns are random variables that can be examined by the process which generates its probability distribution, which in turn, can be described in terms of its parameters that must be estimated from a sample.

In finance, as in many other disciplines, not only are the true parameters (mean, variance, etc.) unknown, but the type of distribution that generates a sample is also unknown. Very often it is assumed that returns follow a normal distribution. This is done partly because statistical techniques for analysing data from normal distribution are abundant relative to the techniques that are available to analyse data from non-normal distributions, also the law of large number indicates that normality is the limit for the true sum of independent distributions.

Our aim is to find out if the normal distribution is a good approximation for the daily or the weekly returns. The purpose is to calculate statistics that will determine the characteristic of the distribution of the daily and weekly returns and compare it to the study of Fama (1965) and unit normal distribution.

5.3 The Hypotheses:

The purpose of this section is to describe and analyse the null hypotheses proposed for this study setting out the statistics before the actual analysis of the results is conducted. The testing frameworks are as follows:

Test A:

Ho : The Gulf Equity market are random.

H1 : The Gulf Equity markets are not weak form efficient (i.e. non random).

That is to apply the runs test which tests for randomness of price changes of each sample from the four Gulf markets. In addition, the dummy variable regression is applied to test for there is any pattern in price changes and that is the day-of-the week effect.

Test B:

Ho : Stock price changes are normally distributed.

H1 : Stock price changes are not normally distributed.

The above hypothesis is be tested by having the empirical distribution for the returns and compare it to Fama results (1965) and to the unit normal distribution. Furthermore, the results of Kurtosis[4] and skeweness[5] is obtained.

Test C:

Ho : Successive price changes are serially independent.

H1 : Successive price changes are not serially independent.

The serial correlation test is used for testing for the independence of price changes on each market.

Test D:

Ho : Transaction costs (the effective bid-ask spread) are comparable to the New York Stock Exchange.

H1 : Transaction costs (the effective bid-ask spread) are Different from NYSE.

The transaction costs measurement is subject to the testing of Roll (1984) model and the Hsia et al (1994) model which is a recent development on the microstructure empirical work.

6.4 Day-of-the Week Test:

The present section is to set out the methodology employed in testing the daily, weekly and monthly effects as it is applied to the Gulf Equity Market.

The literature of seasonal and Day-of-the Week effects used both parameteric and nonparametric methods to investigate these effects; regression, using the dummy variables, is the most widely used parametric method (French 1980; Gibbson and Hess 1981; Lakonishuk and Levi 1982; Keim and Stambough 1984; Jaffe and Westerfield 1985; etc.), this study employs the regression methods to analyse these effects

A market portfolio from each market of the four markets was constructed in order to test the anomalies of the day-of-the-week and seasonal effects. An equally weighted portfolio was constructed from each market. The methodology of the study is to follow the previous research on anomalies.

For the equally weighted portfolio an equal number of logarithmic Returns for each company of each sample selected were calculated over the period

chosen. Then these returns from each sample were used to construct an equally weighted series. The return on the series in day t was the arithmetic mean of return of all companies selected for each sample for each of the four markets as the following equation shows:

$$R_t = \sum_{j=1}^{n} U_{j,t} / n$$

where:

R_t = the return of the equally weighted return series on day t

$U_{j,t}$ = the logarithmic return for share j on day t

n = the number of companies in the sample

The equally-weighted portfolio is the sample chosen as in section 2, that is the most actively[6] traded companies.

Day-of-the Week effect

The following null and alternate hypothesis are tested for each of the Gulf Markets:

Ho: There is no difference in the returns across the days of the week

H1: There is a difference in the returns across days of the week

To test the equality of means across days of the week, we use dummy variable regressions and that is illustrated by the following regression equation:

$$R_t = a_1 + a_2 TUE_t + a_3 WED_t + a_4 THU_t + a_5 FRI_t + e_t$$

R_t is the return on the portfolio, and the dummy variables $(TUE,...,FRI)$ indicate the day of the week on which return for Monday is measured by a_1, while a_2 through a_5 represent the differences between return on Monday and return for the other four days of the week. If the expected return is the same for each day of the week, then the estimate a_2 through a_5 should be close to zero and the F-statistic should be insignificant.

Because there are a limited number of months and years in the sample period selected for each market (they vary between three to four and half years), the month-effect and the year effect will not be tested

5.5 Measurement of the Transaction Costs:

Whilst the classical tests of the weak form of market efficiency are a necessary component of any study of developing stock markets, an important extension of this study is to apply the very recent development of micro-market structure to estimate the transaction costs in the four markets of the Gulf.

The transaction costs are cost paid by investors when trading in the stock market . Therefore direct transaction costs such as the brokers' commissions and other costs like tax by the stock exchange all appear on the investor's monthly statement. The other kind of transaction costs is difficult to identify by the investor but usually can be seen by the market makers by the size of the spread.

Roll's (1984) method is to infer the bid-ask spread directly from the series of stock prices. Hsia, Fuller and Kao (1994) refine the econometrics of Roll's method, as was discussed in section 3.6.

Roll Method:

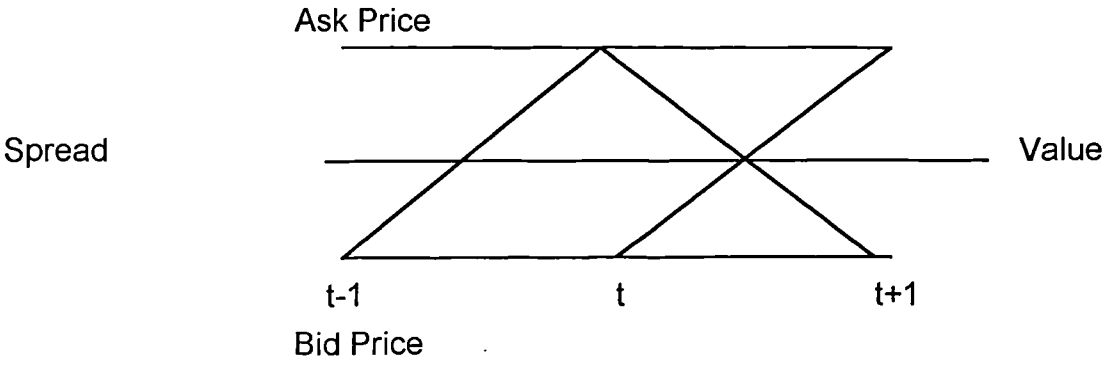
Roll (1984) postulated in his method that there were two effects on market prices. The first is the market information and the second is the transaction costs related to market trading activities. His concentration is the removal of information effect on the prices and then to determine the bid-ask spread. The method is based in the following logic:

1) The market is informationally efficient.
2) The probability distribution of observed prices is stationary at the least on the short term.

When the market reacts to new information then successive price changes are random. However, in the absence of the new information, prices are effected by compensation to the market makers which is the bid-ask spread.

The market makers bid (ask) prices are to follow the following schematic as in Roll:

Figure No. 5.1: The Path of Bid (Ask) Prices



The bid or the ask price is equally likely. There is a similar but opposite asymmetric pattern if the price at t-1 happened to be a purchase from the market maker, at his ask price

The joint probability of successive price changes $(\Delta p_t \equiv p_t - p_t)$ in trades initiated other than by new information depends on whether the last transaction was at the bid or at the ask. This probability distribution (conditional on no new information) consists of two parts as follows;

Figure 5.2: Joint Distribution of Successive Price Changes

		p_{t-1} is at the bid, Δp_t		p_{t-1} is at the ask, Δp_t		
		0	+s	-s	0	
$\Delta p_t + 1 \equiv$	-s	0	1/4	0	1/4	$\equiv \Delta p_{t+1}$
	0	1/4	1/4	1/4	1/4	
	+s	1/4	0	1/4	0	

Price changes in the absence of new information dependent on whether the last transaction was at bid or at ask price. In the absence of information, i.e. when the price series is flat, the share prices should 'rattle' between the bid and ask price, as the trading sequence is buy sell buy sell....

If the last transaction is bid then the next price change can not be negative, conversely if the last transaction was an ask then the next price change can not be positive. There will be a serial dependence between the bid-ask spread and prices.

Since in the absence of the drift the chance of a price movement is a half, Roll's probability scheme of the relation between change in price and spread are as follows:

Figure No. 5.3: The Probability between Price and Spread

		Δp_{t+1}		
		-s	0	+s
	-s	0	1/8	1/8
Δp_{t+1}	0	1/8	1/4	1/8
	s	1/8	1/8	0

To compute the covariance between successive price changes, we need to notice that the mean of Δp_t and Δp_{t+1} are zero; so the middle row and column can be ignored and the covariance is

$$Cov(\Delta p_t, \Delta p_{t+1}) = 1/8(-s^2 - s^2) = -s^2/4 \qquad (A)$$

The covariance between successive price changes is not dependent on new information and that the case in an informationally efficient market. This can be proved (as shown in appendix (A) in Roll, p. 1135) as follows;

$$\Delta \hat{p} = \Delta p_i + \Delta p_t$$

Where

$\Delta \hat{p}_t$ = The observed price change

Δp_i = Price change caused by the arrival of fresh information.

Δp_t = The transaction costs components

If the market is informationally efficient then by definition, we must have;

$$Cov(\Delta p_i , \Delta p_{i-j}) = 0 \qquad j \neq 0 \quad (A1)$$

further

$$Cov(\Delta p_i , \Delta p_{t-j}) = 0 \qquad (A2)$$

The covariances in (A1) are zero because changes in value are surprises in efficient markets. Also, covariances in (A2) are equal to zero because the

movements in bid-ask prices can not be predicted by changes in value. Using both equation (A1) and (A2) , we obtain;

$$Cov(\Delta \hat{p}_t, \Delta \hat{p}_{t-1}) = Cov(\Delta p_t + \Delta p_t, \Delta p_{t-1} + \Delta p_{t-1})$$
$$= Cov(\Delta p_t, \Delta p_{t-1}) = -s^2 / 4$$

Therefore, the covariance between successive price changes is not due to new information (but only to the spread). Further, Roll showed first that implicit spread measure is independent of observation interval if markets are efficient and second even if the spread changes in reaction to news, the serial covariance will still be $-s^2/4$ where the s^2 is the average squared in the sample (see appendix (A) in Roll, p. 1155 for more details).

Because of the pollution of the autocorrelation and variance by the new information the method suggests the use of the covariance instead (the covariance between price changes can not be due to new information). There are aspects needed to be taken into consideration when doing this analysis. First, the result calculated s (spread) is not necessarily the quoted spread. Successive price changes are recorded from actual transactions-so the s (spread) in the probability table above and the equation (a) is the effective spread, i.e. , the spread faced by the dollar-weighted average investor who actually trades at the observed prices. Second, the expected value of the spread-induced serial covariance is independent of the time interval chosen for collecting successive prices. This is implied by the fact that the serial covariance depends only on whether successive sampled transactions are at the bid or at the ask, not on whether any news arrives between the sample observations.

The method requires only the prices of the companies included in the sample where the percentage returns are used for calculation[7]. We will continue to describe first the estimation of the spread and second the relationship between the spread and the size.

First, to estimate the spread, Roll's (1984) method of the measurement of the effective bid-ask spread is as follows:

$$\tilde{S}_{j,t} = 200\sqrt{-\text{cov}}$$

Where:

$\tilde{S}_{j,t}$ = the estimate of the percentage bid-ask spread for the stock.

Cov = is the first-order serial covariance of price changes, the 200 is used to convert to the units to percentage.

Two estimates were made for each company to get the daily and the weekly effective bid-ask spread. The first is the estimate of serial covariance of the daily returns and the second is the estimate of the serial covariance of the weekly returns.

Second, to test the relation between the size and the spread a regression was used. The relations between firm size and the spread is investigated as follows:

$$\tilde{S}_{j,t} = \alpha + \beta \log_e(Size_{j,t})$$

Where;

$Size_{j,t}$ = The market capitalisation in the local currency, (number of shares times the price)[8]

$\tilde{S}_{j,t}$ = the estimate of the percentage bid-ask spread for the stock.

This provides a validity check, if the estimate is reasonable it should be negative correlated to the size, that is big companies should have smaller estimated spreads $\beta < 0$.

Modified method for inferring the effective Bid-Ask Spread

The method also infers the effective bid-ask spread, which is part of the transaction costs paid by the investor, from observed security returns.

The method as described by Chi-Ching Hsia et al. (1994) as an improvement on Roll's method, solving imaginary values that is associated with $\sqrt{-1}$ in the spread estimate.

Hsia, Fuller and Kao (1994) remove the cause of the imaginary estimates by estimating the true but unobservable changes from the observed security returns isolating the residual e_t from the market model as follows:

$$r_t = \alpha + \beta\, r_{mt} + e_t \qquad (1)$$

The effective bid-ask spread is inferred from the residual term e_t, rather than from the total return r_t. They conjecture that the stochastic process of the time series of e_t follows a first-order moving average process MA(1);

$$e_t = a_t - \theta a_{t-1,} \quad (2)$$

where θ is the first-order moving average parameter and a_t is a white noise with mean =0 and variance = σ^2.

Substituting the two equations above yields:

$$r_t = \alpha + \beta\ r_{mt} + a_t - \theta\ a_{t-1} \quad (3)$$

and lagging the above one period we get

$$r_{t-1} = \alpha + \beta\ r_{mt} + a_{t-1} - \theta\ a_{t-2} \quad (4)$$

that is to imply ,

$$\text{Cov}\,(r_t, r_{t-1}) = \beta^2\ \text{Cov}\,(r_{mt}, r_{mt-1}) - \theta\sigma^2 \quad (5)$$

Since $\text{Cov}(r_{mt}, r_{mt})$ tend to be zero in limit[9], the sign of θ is opposite to the sign of $\text{Cov}(r_t, r_{t-1})$. The empirical results of Roll implies that a high percentage of θ are negative which results in a large number of imaginary spread estimates. Equation (5) above implies that a plausible approach for inferring the effective bid-ask spread from security returns should have the capability of restricting the sign of to be positive.

Having identified the source of the problem, a modification of Roll's technique has been proposed by Hsia, Fuller and Kao (1994). That is resolving the problem of imaginary spread estimates by removing the systematic effect of market movements and making use of the correspondence properties of the first serial covariance function and the first order moving average process. The presentation of the modified method is as follows;

$$Cov(r_t, r_{t-k}) = \begin{cases} -(1/4)S^2, \text{ if the lag } k = 1 & (6) \\ (1/2)S^2, \text{ if the lag } k = 0 & (7) \\ 0 \text{ , } otherwise. & (8) \end{cases}$$

and then they rewrite the above after removing the systematic effect of the market movements as follows:

$$Cov(e_t, e_{t-k}) = \begin{cases} -(1/4)S^2, \text{ if the lag } k = 1 & (9) \\ (1/2)S^2, \text{ if the lag } k = 0 & (10) \\ 0, \text{ otherwise.} & (11) \end{cases}$$

Using equation (2) above and the fact that $E(e_t) = 0$ and $Var(e_t) = \sigma^2$ they show that :

$$Cov(e_t, e_{t-k}) = \begin{cases} -\theta\,\sigma^2 \text{ if the lag } k = 1 & (12) \\ (1+\theta^2)\sigma^2, \text{ if the lag } k = 0 & (13) \\ 0 \text{ , otherwise.} & (14) \end{cases}$$

Combining equation (9) and (12) and equation (10) and (13) generates a simultaneous equation

$$-(1/4)S^2 = \theta\sigma^2 \quad (15)$$
$$(1/2)S^2 = (1+\theta^2)\,\sigma^2 \quad (16)$$

and that can be solved to yield

$$\sigma = 1 \text{ and } S = 2\sigma \quad (17)$$

S can be estimated by fitting the following time series model to return data:

$$r_t = \alpha + \beta\, r_{mt} + \theta\, a_t - \theta\, a_{t-1} \quad (18)$$

Where a_t is white noise. The parameter θ is constrained to be equal to 1.

The bid-ask spread is given by :

$$S = \frac{2\,\sigma^2 T}{\sqrt{T}} \quad (19)$$

Where the $\sigma^2 T$ is the estimate of the standard deviation of the white noise process for the entire sample period, which consists of T observations.

5.7 Conclusion:

The chapter constituted of two parts; first is the creation of the data base and the selection of the sample. Second is the methodology section.

The first section gave a details of how the data necessary to conduct this research was collected and it also details the transformation of the raw data to be suitable for use. The description of samples chosen from each market of Kuwait, Saudi Arabia, Bahrain and Oman was given.

In the second section of the methodology, the classic tests for performing the weak form of efficiency were explained. These are a test of whether the share prices follow a normal distribution, serial correlation test and runs tests. Also, whether the return of any day of the week follow any pattern was tested by applying the dummy variable regression method.

Since transactions costs are fundamental to any consideration of market efficiency and give an insight to the market microstructure of any market. A discussion of the methods of estimating the transaction costs was given. These are Roll's model and Hsia, Fuller and Kao new modified method for inferring the effective bid-ask spread from security returns.

Notes of Chapter 5

[1]This data was saved with other data and files of the Kuwait Stock Market by Mr. Abdulla Al-Shayji, head of the department of Archives and Documentation, in the basement of his house during the Iraqi invasion to Kuwait.

[2]It was necessary to enter all the companies data and from then we were able to choose companies that are traded at 30% of the total period selected.

[3]Fama,E., 1965, The behavior of stock market prices' Journal of Business', 34-104.

[4]Kurtosis is a measure of the relative peakedness (leptokurtic) or the flatness (platykurtic) of the curve. The basis of the refernce is the normal distribution (mesokurtic) which has a kurtosis of zero. If the kurosis is positive, the distribution is more peaked than normal distribution. A negative value means that it flater. The common formula to calculate kurtosis based on the fourth momnet is:

$$\text{Kurtosis} = \frac{\sum_{i=1}^{N}\left[(Xi - \overline{X}) / Sx\right]^4}{N} - 3$$

[5] If a frequency distribution is not symmetrical, it is said to be skwed. A serious is to b skewed in the direction of extereme values, or, speaking in terms of the curve, in the direction in which the excess tail appears. The skews statistic will take on the value of zero mean when the distribution is compleetly symmetric. a positive value indicates the observations are clustred more to the left of the mean with most extereme values to the right. When this is the case, the series is said to be skewed to the right. a negative value indicates the series is skewed to the left. relative skewness can be measured in many different ways: 1) it can be measured based on percentiles. 2) Skewness = (mean -mode) / standard deviation. 3) Skewness can be measured based on the third momnet using the following formula:

$$\text{Skewness} = \frac{\sum_{i=1}^{N}\left[(x_i - \overline{x}) / Sx\right]^3}{N}$$

[6]traded at least 30% of the selected sample period.

[7]It is more relevant to measure for comparing the spreads across firms than the arithematic returns. (Roll, p 1330).

[8] Roll, p.1133.

[9] For more details see note (2) on Hsia et al, p. 252.

Chapter VI: Analysis of Results of Weak-Form Efficiency Tests

6.1 Introduction

The purpose of this chapter is to analyse the results of the weak-form market efficiency tests conducted on each country of the Gulf Equity Markets.

This chapter is divided into four sections. The first section analyses the probability distribution of log price changes in preparation for analysing the results of the statistical tests on the weak-form efficiency. The second section is an analysis of the results of the serial correlation coefficient testing and the runs tests for each market, which are tests of independency and randomness respectively. Third, the results obtained from each market are compared to establish the degree of the efficiency between the Gulf Equity Markets. In addition the results are compared with those in the available literature of developed and developing markets . In the fourth section the result of the day of the week effect test is examined to see if there is any pattern showing amongst the four Gulf Markets.

6.2 Distributional Statistics:

This section will begin to discuss the distributions of the proportion of log price changes. The ranges are in terms of standard deviations from the mean for the daily and the weekly data for the markets of; Kuwait, Saudi Arabia, Bahrain and Oman (appendices No. 6-1(1) to 6-1(8)). The section also discusses the results of the skewness and kurtosis measured for each market.

The data was treated for thin trading, before it was transformed and screened for error, as was described in the data and methodology chapter (chapter 5). The price series for the sample of traded stocks of each market is of different lengths and different trading gaps. If there are no trading days in the series any stock, these days are omitted from the sequence.

Tables No. 6-1 and 6-2 illustrates the proportions of observations (daily and weekly) within 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0 and 5.0 standard deviations of the mean as well as the proportions greater than 5.0 standard deviations from the mean . This replicates the analysis of US markets by Fama (1965) and allows a direct comparison with our of the empirical frequency distributions from the Gulf markets. For reference a bench mark comparison with the unit normal distribution is given.

Each cell in the table represents the cumulative average proportion of observed log price differences falling into the particular standard deviation interval specified for the raw sample indicated.

Table No. 6-1: Average Empirical Distributions (Daily)

	$\bar{x}\pm.5$ S.D.	$\bar{x}\pm 1$ S.D.	$\bar{x}\pm 1.5$ S.D.	$\bar{x}\pm 2$ S.D.	$\bar{x}\pm 2.5$ S.D.	$\bar{x}\pm 3$ S.D.	$\bar{x}\pm 4$ S.D.	$\bar{x}\pm \leq 5$ S.D.
Normal	0.383	0.682	0.866	0.954	0.987	0.997	0.999	0.999
US.	0.466	0.745	0.884	0.947	0.975	0.988	0.997	0.998
Kuwait	.621	.859	.930	.961	.977	.985	.993	1.00
Saudi Arabia	.644	.810	.896	.943	.968	.984	.996	1.00
Bahrain	.702	.845	.904	.945	.973	.985	.995	1.00
Oman	.692	.847	.913	.941	.962	.975	.999	1.00

Table No. 6-2. : Average Empirical Distributions (weekly)

	$\bar{x}\pm.5$ S.D.	$\bar{x}\pm 1$ S.D.	$\bar{x}\pm 1.5$ S.D.	$\bar{x}\pm 2$ S.D.	$\bar{x}\pm 2.5$ S.D.	$\bar{x}\pm 3$ S.D.	$\bar{x}\pm 4$ S.D.	$\bar{x}\pm \leq 5$ S.D.
Normal	0.383	0.682	0.866	0.954	0.987	0.997	0.999	0.999
Kuwait	.608	.866	.923	.955	.972	.979	.991	1.00
Saudi Arabia	.626	.888	.932	.960	.978	.990	.997	1.00
Bahrain	.728	.866	.925	.965	.985	.994	.996	1.00
Oman	.737	.875	.927	.950	.962	.976	.990	1.00

Table No. 6-1 reveals that the average of the empirical distributions of the daily data for the four markets is more concentrated within the range of .5, 1, and 1.5 standard deviation of the mean and flat within the rest of the range of distributions. The distributions are particularly more concentrated within .5 standard deviation of the means than the US market with close results for Kuwait and Saudi Arabia markets and similar results for the Bahrain and Oman markets.

The distribution of the weekly data is as shown in table 6-2 has similar trends to those shown in the daily distribution, even though the weekly has less missing observations. Again, the weekly distribution of the four markets is very concentrated within a .5 standard deviations of the mean.

To test for differences among distributions between the four markets for the daily and weekly distributions, a chi-square test was used.

Tables No. 6-3 and 6-4 show the results of chi-square test for the daily and the weekly data respectively for the markets of Kuwait, Saudi Arabia, Bahrain and Oman. The chi-square values are 8.593 for the daily data and 19.164 for the weekly data. These values are not significant at 5% level which direct us to reject the hypothesis that there is any difference between the distributions of the Gulf Markets. The concentration of price changes is a feature of all four markets.

The pattern of the distribution of the four markets shows more concentration than Fama (1965) observed for the United States. The incidence of price changes within a .5 Standard deviation of the mean is double the unit normal which leads ultimately to a rejection of the normality of distribution for the Gulf Markets.

A general observation on the distribution on the four markets is that there are too many small changes for the process to be the type of white noise randomness as described by the normal distribution. These small changes lead us to infer that there are other structures other than the economic structure which are the sources of price changes. These sources of price changes together may itself not be subject to frequent and sudden shifts over time[1]. The distributions are consistent with "managed" prices, where administrators act to dampen volatility. In chapter two we exposed the structure of the Gulf markets which is different from the other developed markets, as there is an upper and lower limit imposed on daily prices an effort to stabilise the market.

Compared to the US market the empirical distributions for the four Gulf markets are even more concentrated around the mean. This is not just a property of thin trading. The zero change observations have been deleted, and the same effect is observed as we consider the distribution of weekly returns.[Weekly returns are less likely to suffer from the thin trading (missing observation bias)].

Table No. 6-3: Differences of Range of Standard Deviation Among the Gulf Markets (Daily data)

Frequency / Row Pct / Col Pct	0.5	1	1.5	2	2.5	3	4	5	Total
Bahrain	702	845	904	945	973	985	995	1000	7349
	9.55	11.50	12.30	12.86	13.24	13.40	13.54	13.61	
	26.40	25.14	24.81	24.93	25.08	25.07	25.04	25.00	
Kuwait	621	859	930	961	977	985	993	1000	7326
	8.48	11.73	12.69	13.12	13.34	13.45	13.55	13.65	
	23.35	25.56	25.53	25.36	25.18	25.07	24.99	25.00	
Oman	692	847	913	941	962	975	990	1000	7320
	9.45	11.57	12.47	12.86	13.14	13.32	13.52	13.66	
	26.02	25.20	25.06	24.83	24.79	24.82	24.91	25.00	
Saudi	644	810	896	943	968	984	996	1000	7241
	8.89	11.19	12.37	13.02	13.37	13.59	13.76	13.81	
	24.22	24.10	24.60	24.88	24.95	25.04	25.06	25.00	
Total	2659	3361	3643	3790	3880	3929	3974	4000	29236

STATISTICS FOR TABLE OF COUNTRY BY STDGPA

Statistic	DF	Value	Prob
Chi-Square	21	8.593	0.992
Likelihood Ratio Chi-Square	21	8.627	0.992
Mantel-Haenszel Chi-Square	1	0.710	0.399
Phi Coefficient		0.017	
Contingency Coefficient		0.017	
Cramer's V		0.010	

Sample Size = 29236

Table No. 6-4: Differences of the Range of Standard Deviation Among the Gulf Markets (Weekly Data)

Frequency / Row Pct	0.5	1	1.5	2	2.5	3	4	5	Total
Bahrain	728	866	925	965	985	994	996	1000	7459
	9.76	11.61	12.40	12.94	13.21	13.33	13.35	13.41	
Kuwait	608	866	923	955	972	979	991	1000	7294
	8.34	11.87	12.65	13.09	13.33	13.42	13.59	13.71	
Oman	737	875	927	950	962	976	990	1000	7417
	9.94	11.80	12.50	12.81	12.97	13.16	13.35	13.48	
Saudi	626	888	932	960	978	990	997	1000	7371
	8.49	12.05	12.64	13.02	13.27	13.43	13.53	13.57	
Total	2699	3495	3707	3830	3897	3939	3974	4000	29541

STATISTICS FOR TABLE OF COUNTRY BY STDGPA

Statistic	DF	Value	Prob
Chi-Square	21	19.164	0.575
Likelihood Ratio Chi-Square	21	19.188	0.573
Mantel-Haenszel Chi-Square	1	0.181	0.670
Phi Coefficient		0.025	
Contingency Coefficient		0.025	
Cramer's V		0.015	

Sample Size = 29541

Table No. 6-5: Moments Statistics of Daily Observations

Country	Skewness	Kurtosis	Mean	Standard Deviation
Kuwait	1.5572	56.0489	0.0001	0.0263
Saudi Arabia	5.2146	34.2110	.0009	0.0628
Bahrain	0.6537	48.3561	.0016	.0323
Oman	-0.8645	30.5015	0.0011	0.0213

We shall now proceed with other measurements of the normal distribution; skewness and kurtosis.

The analysis of the results for skewness shows a significant departure from normality as shown from the sample individual values and the average of the sample of each market.

For the average result of the daily data shown in table 6-5 for all the four markets, we find the Saudi Arabia market has the largest skewness value of 5.20. Positive skewness indicates that falls are much smaller and infrequent than price rises. This is a characteristic of a managed market, not only are there too many small price changes, but falls are particularly avoided, giving large skewness measure. The skewness for Kuwait is 1.557 , Muscat with -.8645 and then Bahrain with .6537. As we can see, the results from Saudi Arabia, Kuwait and Bahrain are positively skewed and Muscat result is negatively skewed.

The results of skewness for individual companies for each sample; (1) 4 negative values and 15 positive values for Kuwait, (2) 2 negative values and 23 positive values for Saudi Arabia (3) 6 negative values and 5

positive values for Bahrain, and (4) 4 negative values and 9 positive values for Muscat. The majority of skewness individual values are significant at 5% level for the four markets.

Looking at table No. 6-5, we notice a significant departure from normality shown by the sample's values and the average of each sample values of the four markets. The results of the kurtosis individual values also shows significant departure from normality for all the four Gulf markets. Most companies returns from each market show significant positive kurtosis with quite high values.

The average results of the four samples for kurtosis are; 34.21 for Saudi Arabia, 56.04 for Kuwait, 48.35 for Bahrain and 30.50 for Muscat. The results indicate that return on all the Gulf stock market are leptokurtic or the returns of each market cluster within close range of the mean.

6.3 Serial Correlation Coefficient Analysis:

Samuelson (1965) stated that a property of perfectly anticipated prices is that they fluctuate randomly. It follows that in an efficient market there can be no predictability of the change in today's price from the change of yesterday's price or previous days . For our samples, the serial correlation test conducted to determine the dependency between the price changes at time t and price change at time t+k, for k = 1,2,3,...,. Prices changes are independent of each other if the serial correlation coefficient is zero. A complete listing of all serial correlation data is presented in the appendices . The serial correlation coefficient on the data's log price differences between consecutive trading days (differencing interval 1) is computed for lags 1,2,3,4,5 and 10. The results presented are for the daily

and weekly data for each sample selected from Kuwait, Saudi Arabia, Bahrain and Oman.

The entries on appendices 6-2(1) to 6-2(8) marked by * are the ones significant at 5% level i.e. the serial correlation coefficient of that entry is significantly different from zero at 95% confidence level. An absolute average of serial correlation coefficient of the sample size is also produced for each market to make a comparison between the Gulf markets and the estimates in the literature for other markets.

Serial Correlation Results: Kuwait

The results of the 19 companies selected as sample from the Kuwaiti market are shown on appendix No. 6-2(1) .

The largest coefficient value is -0.2751 and the smallest is -.0271; while the mean serial correlation of lag 1 for Kuwait stock market is -0.1075

The results of the daily serial correlation for the sample selected for lag1 all are negative except for one company which has a positive value. All the serial correlation results are significant at a 5% significance level, the independency of log prices is rejected for the daily data of Kuwait stock market.

For lag 1 of the weekly data in appendix 6-2(2), the values of the serial correlations ranges from -.4727 to .41 with 13 negative values. There are 13 values significant 5% level which lead to the rejection of the independency for the weekly data.

Serial Correlation Results: Saudi Arabia

Like the pattern of Kuwait market prices, we notice that 20 values of the serial correlation coefficients of the daily prices as shown on appendix 6-2(3) are significant at 5% level. The majority of these values of the serial correlation coefficients as can also be seen from the table of results are negative.

The results of the serial correlation coefficients shows the non independence of the share prices. This could be because of the nature of the trading on which the orders are executed through the banking units which has an effect on the speed of executing these orders. Also, the movements of the prices can be seen dependent on speculation. The volume of trading was encouraged by the escalation of the share prices due to the mood of speculation happening on the market, especially after the Gulf War. Optimism increased because of perceived better security of the area and a stable economy which has resulted in an active market.

The weekly data results on appendix 6-2(4) show a dependency of share returns. All the serial correlation coefficients are negative with the majority significant at 5% level. Therefore, according to the results of the serial correlation coefficients the independency of share prices is rejected.

Serial Correlation Results: Bahrain

The serial coefficients values ranges from -.37 to .178. It is clear that most of the serial correlation coefficients of lag 1 for the daily data are significant at 5% level and that is 8 companies values as it is shown in appendix No. 6-2(5).

For the weekly data of the selected sample of Bahraini companies as in appendix 6-3(6), the values of serial correlation coefficients ranges from -.412 to .386 with 5 serial correlation coefficients significant at 5% level. The absolute mean value of the serial correlation coefficients is .20. Here, the independence of the shares returns is rejected both for the daily and the weekly data of the Bahraini market.

Serial Correlation Results: Oman

The values of the serial correlation coefficients (see appendix 6-3(7) ranges from -.149 to .128 for lag 1 of the daily data of Muscat market. There are 4 values, out the total serial coefficients, significant at 5% level.

The weekly serial coefficient values ranges from -.566 to .241 with 3 values significant at 5% level.

A similar trend of the daily data of the Saudi Market is observed here in the weekly data of Muscat, showing a low volume of serial correlation coefficients which might have been the cause of the low volume of trading.

Table No. 6-6 gives a comparison of the absolute mean average between the Gulf Equity market. We find that Bahrain has the largest absolute mean of the serial correlation followed by Kuwait, Muscat and Saudi Arabia. The results of the absolute mean of the daily data for the four Gulf markets are; .123 for Kuwait, .0026 for Saudi Arabia, .2067 for Bahrain and .073 for Oman.

Table No. 6-6: A Comparison of the Mean Absolute Values

Country	Absolute Mean Serial Correlation Coefficients -Daily	Absolute Mean Serial Correlation Coefficients-Weekly
Kuwait	.1230	.2170
Saudi Arabia	.1317	.3000
Bahrain	.2067	.2007
Oman	.0730	.1920

Comparison with other Studies:

The result of the serial correlation of this study is to be compared with other studies of the same methodology as presented in table No. 6.7; Fama (1965)[2], Dryden[3] (1970), Jennergen and Korsvold[4] (1970) and Conrade and Juttner[5] (1974), Al Mudhaf (1983)[6], Pencek[7].(in a comparison of NYSE, AMEX and OTC in 1988) and Laurence et al. (1986)[8].

As can be seen from the table 6-7, with the exception of the result of Al Mudhaf (1983) only Muscat market has an absolute mean value which is regard to be comparable to the American, European and newly emerged markets of Malaysia and Singapore. However, Al Mudhaf (1983) result of low absolute mean value of .055 is attributed to the speculation period and the loose control included in the period selected in his study where he cleared that by saying that is the main reason for having the low serial

coefficients. This study did not account for the problem of infrequency of trading when the sample of 30 companies was selected for the study.

Muscat's low results could be attributed to the tight regulation adopted by the stock market officials of Muscat and the low volume of trading in the stock market having an effect on the serial correlation results.

The other two markets Kuwait and Bahrain show a high mean absolute values, especially when they are compared to the newly emerging markets of Singapore and Malaysia.

Table No. 6-7: Comparable Results of the Mean Absolute

Country	Stock Market	No. of Stocks	Mean Absolute Coefficients
Kuwait	Kuwait	19	.123
Saudi Arabia	Riyadh	25	.1317
Bahrain	Manama	11	.2067
Oman	Muscat	13	.073
US	NYSE	30	.048
UK	London	15	.093
Germany	Frankfurt	54	.217

Sweden	Stockholm	30	.109
Norway[9]	Oslo	15	.083
Singapore	Singapore	16	.042
Malaysia	Kuala Lumpur	24	.078
US	NYSE	30	.073
US	AMEX	34	.077
US	OTC	30	.160
Kuwait (1983)	Kuwait	30	,055

6.4 Runs Results Analysis:

A runs test was conducted to test the randomness of the percentage of price changes. The percentage changes are random if the K observed is within + or -1.96 at the 5 percent level of significance, or if K observed is within + or -2.576 at the 1 percent level of significance. The runs test were calculated for the same sample of study as in the method of Fama (1965).

The expected number of runs (RE) will be compared with the actual number of runs (Runs) and the standard error is (SRE) and the standardised normalised variable K will be used to test the statistical significance of (Re-runs).

The results for differencing interval 1 for the total data for each of the Gulf markets can be seen in appendices 6-3(1) to 6-3(8). We have four columns, the first column shows the total number of runs, the second columns gives the expected total number of runs if the process was normal, the third shows the standard error of the expected number of runs and the fourth column shows the standardised variable K which is the test statistic.

Run Results: Kuwait

Appendix No. 6-3(1) shows the result of runs tests for the daily data . All the 19 companies have a positive test statistic with 16 significant at two standard error. The magnitude of the standardised variable (K) differs from .878 to 6.410 The average test statistic for the selected daily sample for Kuwait market is 3.40.

A positive sign means that the actual runs are more than the expected runs. That is to confirm the serial correlation analysis that we have, rapidly altering signs in the price changes would provide large negative serial correlation and also a large numbers of short runs. Therefore, the positive runs of the daily data are consistent with the negative serial correlation.

In the runs test for the weekly data, the standardised variables range from 6.4104 to .2062 with all values positive and 11 values significant at two standard error (see appendix No. 6-3(1).

The standardised variable for the weekly data ranges from -1.286 to 4.95 with 11 values of 19 values are significant at two standard error. For two companies the K's statistic is negative indicating less runs than randomness would suggest.

The results of runs test for the daily and weekly data are consistent with the results of the serial correlation of the same data. However, both results confirm the non randomness of the data for the weekly data.

Run Results: Saudi Arabia

The range of the standardised value K of the runs tests for the daily data in appendix 6-3(3) is to range from 13.721 to .0649 with 19 positive values and 6 negative values. The number of significant values of K at 5% level is 22 values.

The K values of the weekly data ranges from 4.87 to 2.38 with an average of 3.55 and the sign of K values is positive. Also, we find that all K values are significant at two standard error

The results of the runs test show that there is a non randomness in the daily and the weekly data of the Saudi market and that supports the results of the serial correlation test.

Run Results: Bahrain

The runs tests identify non randomness for the daily data of Bahrain market. Most of the standardised values are negative and that means that the actual number of runs are more than the expected number of runs and these values are significant at 2 standard error to indicate the pattern of non randomness in the Bahraini data.

The standardised values of the runs tests result for the daily data reported at appendix No. 6-3(5) shows that all values are positive and only 1 value is negative. Also, all companies' values with the exception of one company value are significant at two standard error and the standardised values ranges from -1.390 to 9.28. The runs result are consistent to a large extent with the serial correlation results, that is the majority are negative and significant at 5% level.

The weekly runs results in appendix 6-3(6) reveals that 7 companies values are significant at two standard error and that again show non randomness on the weekly data. All the value are positive but one company value is negative and the standardised values for the weekly data are to range from -1.368 to 4.011.

Run Results: Oman

The results of the runs tests of the daily data is reported in appendix No. 6-3(7). As we can see from the results, 7 out of 13 prices movements series used in this test do not appear to be binomially distributed. The range of K variable is ranging from 4.68 to -.069.

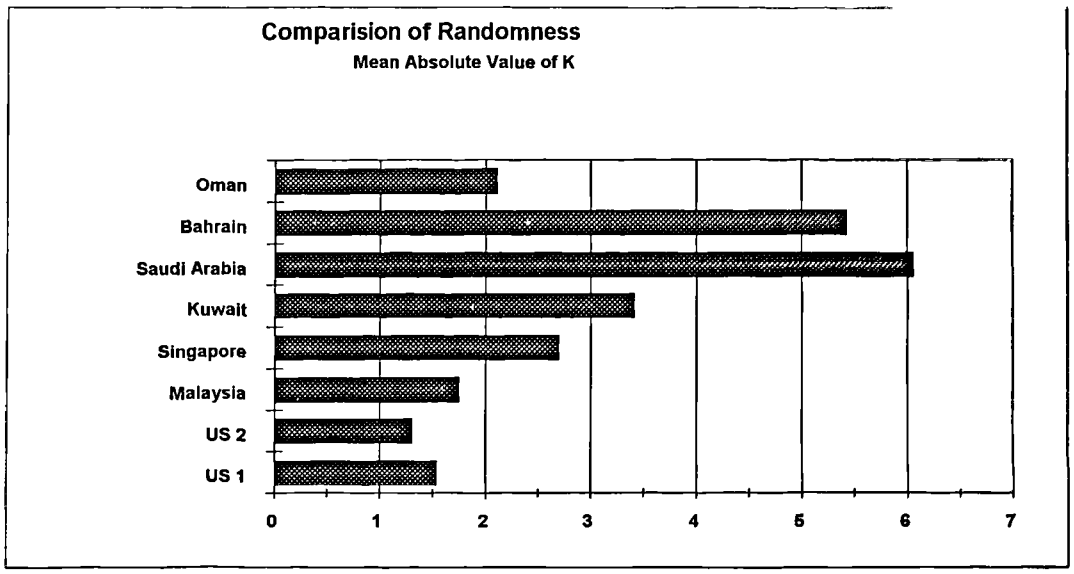
on the other hand for the weekly results reported in appendix No. 6-3(8), there are only 2 of the 13 values that are significant at two standard error. The K values for the weekly data range from -.126 to 2.68. These results for the weekly data suggest that there is a tendency for the price movements in the shares listed on Muscat stock market to follow the random walk, thus accepting the weak form efficiency in the weekly data.

Comparison with other Studies:

To see the whole picture of the randomness of the Gulf Markets, we take the absolute mean values as shown in table 6-6. The behaviour of the daily data of each sample from the Gulf markets is shown to be non-random from absolute mean of the standardised value K, the values are; 3.4 for Kuwait, 6.044 for Saudi Arabia, 5.417 for Bahrain and 2.087 for Oman . The same conclusion is drawn from the weekly data except the stock market of Muscat which show less of K of 1.07 in comparison with the others.

The comparable results of the mean absolute values of the standardise variables of K for the Gulf markets with other markets as in table N0. 6-8. The results of The Gulf Markets are close to the mean absolute value of the standardise variable k of over-the-counter and some European markets. On the other hand, it shown to be more than those of; NYSE, AMEX and Malaysia and Singapore.

Figure No. 6.1: Comparison of Randomness



US 1: Fama (1965)
US 2: Pencek (1988)

The Muscat results are shown to be less than some of the European markets and Singapore and above those of NYSE, AMEX and Malaysia.

The non-randomness seen in the four markets could be the result of several factors for example; firstly, these markets are relatively new which may imply thinness. In new markets there is a) Slow release of information b) Slow reaction of prices to information. Second, managed prices where big investors who are usually followed by small investors are affecting the movement of the prices.

Table No. 6-8 Absolute Mean Average of The Standardised value of The Run Tests for the daily data

Country	M.A.S.V.	Country	M.A.S.V.
Kuwait	3.40	Sweden[10]	4.64
Saudi Arabia	6.044	Norway[11]	4.69
Bahrain	5.417	US (NYSE)[12]	1.289
Oman	2.087	US (AMEX)[13]	1.472
US[14]	1.52	US (OTC)[15]	4.593
UK[16]	3.29	Malasyia[17]	1.73
Germany[18]	3.8	Singapore[19]	2.67

M.S.A.V: Mean Absolute Standard Value.

6.5 Day-of-the Week Results

We shall discuss in this section the results of the weekend effect (day of the week) for periods selected[20] for each market. The test to be used is the dummy variables regression which was discussed in the Data and Methodology Chapter.

The test of equality of means of returns across days of the week was applied to each of the data sets from the stock markets of Kuwait, Saudi Arabia, Bahrain, and Muscat.

The national holidays for Kuwait, Saudi Arabia (trading on Thursday was abandoned on February 1989) and Oman are Thursday and Friday and for Bahrain it is Friday and Saturday.

Table 6-9 lists four moments of returns distributions of equally weighted portfolio with T and F statistics during each period studied for Kuwait, Bahrain and Oman. Due to the split of the period studied for the Saudi market in two periods another table of moments of statistic were produced as on table 6-10.

The results on table 6-11 of the equally market portfolio of each market shows the equality of coefficients of each market. The F-statistics values in table 6-12 are .427 for Kuwait, 1.604 for Bahrain and 1.158 for Oman which are not significant at 5% level for these three markets as presented by their probabilities.

Because of the change of the number of trading days we had to divide the period for the Saudi Markets into two periods. The first started from January 1987 to 2 February 1989 with six trading days from Saturday to Thursday and the second starts from 3 of February 1989 to July 1992 with 5 trading days from Saturday to Wednesday.

The F value of 2.541 of dummy variable regression results of testing the equality of returns for the first period shown to be significant at 5% level. Days with a different mean returns are Sunday, Wednesday and Thursday.

The second period also shows a difference among the returns of the days of the week as evidenced by the F value of 3.572 which is significant at 5% level. It is clear that the effect comes from Sunday and Wednesday.

The results for both periods tested from Saudi Arabia present the day of the week effect. However, we see that the first period has three days with their means different and the second period is the Sunday and Wednesday to have a different means from other days of the week. The effect of Sunday and Wednesday seem to be present in both periods.

Table 6-9: Moments Statistics for Kuwait, Bahrain and Oman.

Kuwait	Saturday	Sunday	Monday	Tuesday	Wednesday
Mean	-.00029	-.00077	.00033	-.00064	-.00061
Std	.01211	.01245	.01220	.01093	.00986
Skewness	.2448	.6491	.7798	-.2034	.4738
Kurtosis	1.0055	4.5894	4.6596	1.9922	3.2315
T-Value	-.3205	-.8295	.3621	-.7912	-.8396
Number of Observations	170	176	178	180	179
Bahrain					
Days	Sunday	Monday	Tuesday	Wednesday	Thursday
Mean	-.000731	.001718	.001334	.001330	.003071
Std	.017381	.016756	.015051	.020862	.017022
Skewness	-.377105	-.049979	3.33815	3.06265	6.041138
Kurtosis	3.14415	2.52722	-.87423	-.455857	-.759717
T-Value	-.50694	1.25199	2.09294	.781297	2.202791
Number of Observations	145	149	152	150	149
Oman					
Days	Saturday	Sunday	Monday	Tuesday	Wednesday
Mean	.000011	.000792	.000262	.001872	.000038
Std	.009392	.011993	.010268	.010207	.009518
Skewness	-.36444	-.816266	.205579	1.34451	.555924
Kurtosis	2.84952	9.576771	1.47821	4.81913	4.94631
T-Value	.014788	.795796	.310389	2.22412	.048029
Number of Observations	142	145	147	147	143

Table No. 6-10: The Moments Statistics for the Two Periods for the Saudi Market.

Saudi Arabia Period (1)	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday
Mean	.0001988	.004815	.00176	.000412	.00400	.00527
Std	.0153	.0162	.0195	.0195	.0172	.0155
Skewness	-.306	.194	-.043	-.211	-.057	.0154
Kurtosis	.229	.994	2.196	-.604	.159	.0353
T-Value	.121	2.84	.876	.205	2.198	3.267
Number of Observations	89	92	95	95	90	93
Saudi Arabia Period (2)	**Saturday**	**Sunday**	**Monday**	**Tuesday**	**Wednesday**	
Mean	.0047	.0052	-.0012	.0052	1.973	
Std	.018	.016	.016	.0158	0.0155	
Skewness	3.52	.653	-1.24	.135	-.033	
Kurtosis	23.53	1.198	6.377	.276	.487	
T-Value	2.709	3.24	-.781	3.41	.0013	
Number of Observations	110	109	109	108	106	

In general the results from the Saudi Arabia Market are shown to be different from the other three Gulf market by having the day of the week effect for both periods as we just have examined. The particular day of the week effect is unlike any encountered in the literature. The dominant effect in US is the dummy variable parameter on Mondays. The explanation of this is the bias in releasing bad news over the weekend when the markets are closed, giving a price fall on Monday when the market re-open. Saudi Arabia has positive dummy variables, both mid-week and post week-end.

Table No. 6-11: The F Values and the Probabilities of the Dummy Variable Regression to Test the Equality of the Mean of Returns Across Day of the Week

Country	F Value	Prob.
Kuwait	.427	.829
Saudi Arabia (Period 1)	3.572	.0018*
Saudi Arabia (Period 2)	6.226	.0001*
Bahrain	1.604	.156
Oman	1.158	.328

***Significant at 5% level.**

The pattern of the day of the week results from the four of the Gulf markets is shown to be different form those of the US and UK and other markets. First, Kuwait, Bahrain and Oman markets have shown they do not have day of the week effect as it was evidenced from the F value of the regression. Second, the market of Saudi Arabia is shown to have a unique day of the week effect and the results of both periods[21] differ from what is called Monday's effect which many of the World stock markets have shown to have, for example, the US market (French 1980).

This result is general for these markets at present which could partly be explained by the fact that these markets are closed markets (as shown by their regulation and suggestions raised on the survey chapter) as they are not opened to foreign investors (individuals and institutions). A good example that these markets have their own character and pattern of behaviour, is that they were not effected by the Crash of 1987 (Black Monday) which started in the American markets. However the results obtained do point out that the Saudi Market is different from other Gulf markets.

6.6 Conclusion:

The chapter examined the weak form of the efficient market model by testing whether the stock price changes are independent and identically distributed random variables. At first, the price changes of the four markets were tested to see if they follow a normal distribution. Secondly, the two standard tests serial correlation and runs test were applied in addition to the dummy variable regression (day-of-the week effect) to test the independency of the stock price changes amongst the Gulf Markets. The summary of the results for the four markets is shown in table No. 6-12.

The results for both the daily and the weekly data for all the four markets show a concentration of the data between .5 to 1.5 standard deviation of the mean and with less observations at the end, and as a result the normality of the distribution of this data is rejected. We further analysed and compared the result of this data with the results of the earlier work of Fama (1965) and Pencek (1988) and the distribution of the data is again shown to be more concentrated for both the daily and the weekly data. This is consistent with administrated or managed prices which aim to damp fluctuations.

The Kurtosis values of the daily data for all the four markets again confirm the lack of normal distribution test results which is a concentration of the data. The skewness values of the daily data are shown to be positively skewed for Kuwait, Saudi Arabia and Bahrain whereas the Muscat value is shown to be negatively skewed. Positive skewness is consistent with a surfeit of price increases.

Table No. 6.12: Summary of the Results of the Four Gulf Markets

Country	Norm.*	Skew.*	Serial Corr.*	Runs	Day of the Week
Kuwait	No	+	-	more	No
Saudi Arabia	No	+	-	more	Yes
Bahrain	No	-	-	more	No
Oman	No	+	0	more	No

** Norm=Normality*

**Skew=Skewness*

**Corr=Correlations*

The findings for the serial correlation coefficients for one day-interval of the daily data for Kuwait and Saudi Arabia and Bahrain stock markets do not support the independence. On the other hand, the daily data and weekly data showed less dependency for the Muscat market which is opposite for Kuwait and Saudi Arabia and Bahrain Markets. The coefficients were very small and very few were significant.

As a result of the serial correlation coefficients for the three markets: Kuwait, Saudi Arabia and Bahrain do not show the independence of the stock returns and was rejected for the daily and the weekly data.

When the stocks were tested for randomness, the runs test for the daily data revealed that the majority of stocks for Kuwait, Muscat, Bahrain and Saudi Arabia were shown to be non-random. Non-randomness of the weekly data also applied to the data of Kuwait and Bahrain. More runs than random is consistent with serial correlation in which positive changes tend to follow positive changes and so on.

The investigation of the day of the week effect has shown that three of the Gulf markets are different from the other markets in the sense that the mean of returns across days of the week are equal which denied the pattern of the day-of-the week effect (typically Monday) witnessed in other studies. On the other hand, the mean returns across days of the week is different for the Saudi market in the two periods tested indicating special characteristics of the Saudi market.

Finally, the results discussed in general showed that there were certain departures from the weak form hypothesis for the Gulf Equity Markets.

Notes of Chapter 6

1 Fama, E.F.(1965) " The Behavior of The Stock Prices." *Journal of Finance* , pp 40-41.
2 Fama, E.F.(1965) " The Behavior of The Stock Prices." *Journal of Finance* , 34-105.
3 Dryden, M. M., (1970), 'A Statistical Study of U.K. Share Prices', *Scottish Journal of Political Economy*, Vol. 17., pp 103-107.
4 Jennergen and Korsvold,(1975),'The non-random charcter of Norwegin and Swedish Stock Market Prices' *in International Capital Markets*' Edited by E. J. Elton and M. J. Gruber, North Holland.
5 Cornade, K. and D. J. Juttner, (1973),'Recent Behavior of Stock Market prices in Germany and the Random Walk Hypothesis', *Kyklos*, No. 26, pp 576-599.
6 Al-Mudhaf, J., (1983), "Kuwait Stock Market: Its Efficiency", unpublished Ph.D. thesis, University of Birmingham.
7 Pencek, T. A. (1988), 'A Comparison of Relative Efficiency Measures of the Major United States Stock Exchanges', PH.D. Thesis, Mississppi State University.
8 Laurance, M. M., (1986), 'Weak-Form Effeciency in the Kuala Lumpur and Singapore', *Journal of Banking and Finance*, Vol. 10, pp 431-445.
9 Jennergen and Korsvold,(1975),'The non-random charcter of Norwegin and Swedish Stock Market Prices' *in International Capital Markets*' Edited by E. J. Elton and M. J. Gruber, North Holland.
10 Jennergen and Korsvold, op. cit.
11 Jennergen and Korsvold, op. cit.
12 Pencek, T. A., op. cit.
13 Pencek, T. A., op. cit.
14 Fama, E. F., op. cit.
15 Pencek, T. A., op. cit.
16 Dryde, M. M., op. cit.
17 Laurance, M. M., op. cit.
18 Cornade, K. and D. J. Juttner, opicit.
19 Laurance, M. M., op. cit.
20 The period specified on the data and methdology chapter .
21 As we explained the total studied period for the Saudi market was broken into two periods because of the changing of the number of trading days.

Chapter VII: Transaction Costs Results

7.1 Introduction:

There are two kinds of transaction costs incurred by the investor when dealing on the stock markets (buying or selling shares)[1], these are the implicit and the explicit costs. The explicit costs are borne by the investors and include the commission costs and taxes. The commission costs charged by the brokers are sometimes negotiable based on the order size. It is usually hard to measure the implicit costs in comparison with the commission costs, but these costs can be clearly noticed through executing the order at a high price (buy) or low price (sell). As a result of size and/or sparsity of counterpart orders on the market this spread or "touch" can be wide. Instances of a large difference between the buying and the selling orders can be seen often in many of the small and thin traded markets.

This chapter will analyse the results of the estimation of the inferred bid-ask spread where the first method is the measurement of the spread as in Roll's model (1984)[2] and the second method is a development on Roll's work to measure the bid-ask spread by Hsia et al. (1994)[3].

7.2 Roll Methodology and Results:

7.2.1 Methodology

The Roll method states that the effectual bid-ask spread can be inferred from the first-order serial covariance of price changes . That is to say in an efficient market the formula for the effective bid-ask price is

$$Spread = 2\sqrt{-\text{cov}}$$

where the "cov" is the first-order serial covariance of price changes.

This method requires that the market to be informationally efficient and the probability distribution is stationary for the price changes (at least on the short term).

7.2.2 Results:

The results of the bid-ask spread method and the relation between the spread and the size of each market will be explained and discussed in this section.

The estimations of bid-ask spread from the daily data as given in table 7-1 and graphed in figure 7-1. These graphed the results of 1.54% for the Kuwait data, 5.26% for the Saudi data, 2.06% for The Bahrain data and .46% for the Muscat data.

The same technique of estimation of the inferred bid-ask spread based on weekly data is given in table 7-1 and showed in figure 7-1. This gives the .97% to Kuwait data, 7.54% for Saudi Arabia, .45% to Bahrain data and -.06% to Muscat data.

These results are averages and appendices No. 7-1 to 7-4 show the estimated inferred bid-ask spread based on daily and weekly data for each company in the sample.

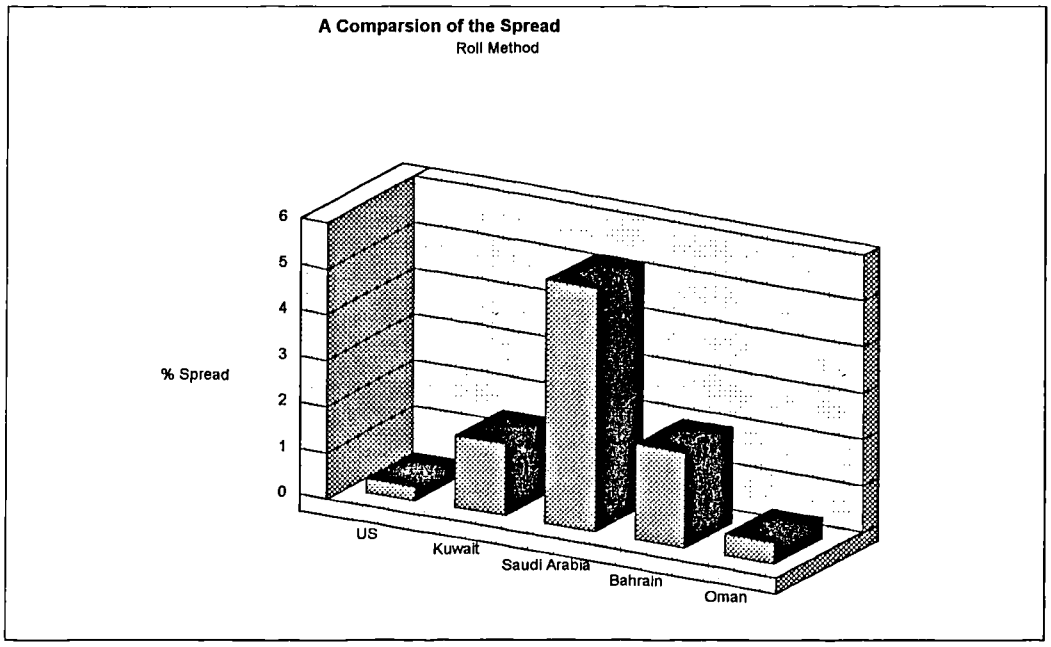
Table No. 7-1: The Estimated Bid-Ask Spread

Country	Spread Estimate of the Daily Data %	Spread Estimate of the Weekly Data %
Kuwait	1.54	.97
Saudi Arabia	5.265	7.54
Bahrain	2.06	.450
Oman	.46	-.06

Comparing the estimated value of inferred bid-ask spread of the daily data to the weekly data, we find that the daily estimate is more than the weekly estimate in all these markets except the Saudi market. Roll's findings of the daily estimate was less than the weekly estimate taken from his sample selected from the New York Stock Exchange.

Roll's results of the daily data associated with a large number of imaginary values, the number associated with $\sqrt{-1}$. The percentage of the imaginary values on Roll's results in the daily data is 51.4[4] percent negative which has resulted in the daily estimate spread value of .298.

Figure No. 7.1: A Comparison of the Spread (Roll).



In the daily data that we have used, the percentage of imaginary numbers as shown on table No. 7-2 are approximately; .318 for Kuwait, .485 for Saudi Arabia, .328 for Bahrain and .314 for Muscat. The percentage of imaginary numbers associated with the weekly data are; .311 for Kuwait, .497 for Saudi Arabia, .325 for Bahrain and .301 for Oman.

In comparison with Roll's finding, we see that in general the daily data from the samples of these three markets has less imaginary values, and for the weekly data we have close results for all the markets with a close percentage of the number of imaginary values which is similar to Roll's results. In further comparison we have more imaginary values for the Saudi market; .485 for the daily data and .497 for the weekly data which is much closer to Roll's percentages.

Table No. 7-2: The Proportion of Imaginary Values in the Daily and Weekly Data

Country	Daily	Weekly
Kuwait	.318	.311
Saudi Arabia	.485	.497
Bahrain	.328	.325
Oman	.314	.301

Clearly this percentage of imaginary values is a serious problem, and cast doubt on the reliability of estimates. For Oman to have a negative spread of .06% is not credible. The modified method remedies this problem and provides more reliable estimates.

Before turning to the modified method, we look at the relationship between the spread and the size as measured by the coefficient of the regression. Size is defined as being the number of shares times the price (in our case, the prices were taken in local currency for each market). Theory suggest that spread should be negatively related to volume of trading. The greater the volume of trading the narrower the spread. Taking size as a proxy for the volume, table 7-3 shows the results between the spread and the size which are for the daily data; -.152 for Kuwait, -.717 for Saudi Arabia, -.249 for Bahrain and -.368 for Oman. The relationship between the spread and the

size is also shown for each market for the weekly data; -.314 for Kuwait, -.625 for Saudi Arabia, -.155 for Bahrain and -.366 for Muscat.

Table No. 7-3: The Relation between the Size and Spread as Measured by the Regression Coefficients

Country	Daily	Weekly
Kuwait	-.152	-.314
Saudi Arabia	-.717	-.652
Bahrain	-.249	-.1550
Oman	-.368	-.366

We can see from table 7-3 which measured the regression coefficients, that the relationship between the spread and the size for all four markets for the daily and the weekly data is negative. The negative relation between the spread and the size show that our results are similar to the finding of Roll in NYSE where his results showed a -.442 for the daily and -.495 for the weekly. However, we notice that the Saudi market has a stronger negative relationship between the spread and the size of -.717 for the daily data and -.652 for the weekly data in comparison with the other Gulf markets and Roll's finding on NYSE. Thus although due to the imaginary number problem there is a problem with the reliability of the estimates, they do exhibit the correct properties.

In a further comparison, the relation between the spread and the frequency of trading is measured on each market, where the frequency of trading is the percentage of number of trading days to the total days period. The regression results (coefficient) is shown on table No. 7-4. as follows:

Table No. 7.4: The Relation between the Spread and the Frequency of Trading.

Country	Kuwait	Saudi Arabia	Bahrain	Oman
Daily Data	-.0131	.0010	-.0470	-.0279

The figures in the above table show a small negative relation between the spread and the frequency of trading for the three markets and as follows; -.0131 for Kuwait, -.0470 for Bahrain and -.0279 for Oman. On the other hand, there is a small positive relation between the spread and the frequency of trading for the Saudi market of .0010.

The results discussed show that the Muscat market estimates of the daily and weekly bid-ask spread is the lowest among the Gulf Markets. An explanation of this can be attributed to two debates; firstly, that the officials of the Muscat markets have benefited from the experience of the other Gulf markets and that by keeping the market in an orderly way they could avoid the manipulation and speculation that happened in Kuwait (Al Manakh Crisis) in 1982. Secondly, the effect of low orders of selling and buying as a result of the thin trading in the market.

We further analyse the estimation of the bid-ask spread by asking some professional people; " How much do you think is the effective bid-ask spread in the market?" . The idea of addressing this question came after this analysis was done to compare the indirect estimation of the bid-ask spread by Roll's model to the direct estimation as seen by those professional people. Two professional people were chosen from each market based on their availability and their willingness to cooperate and also taking into consideration the limited time that was available. The general census amongst the people asked was that it is very hard to quantify effective bid-ask spread for the market as a whole and it is much easier to quantify it may be for the very active companies and certain sectors in the market rather than the market as a whole. However, the answers that we have are the bid and offer prices held at the office for each company at the time we raised the question and from that we took the average for each market for the four market as answered by respondents[5]. Table No. 7.5 shows the average spread for each market.

The Figures on the table is showing the market spread to be .0145 for Kuwait, .023 for Saudi Arabia, .016 for Bahrain and .025 for Oman with the figures estimated by Roll method for comparison. As we have noted due to econometric difficulties these estimates are not as reliable as the ones which we now make.

Table No. 7.5: The Direct and Indirect Estimates of the Spread

Country	Kuwait	Saudi Arabia	Bahrain	Oman
Direct Estimate	0.0145	.0230	.0160	.0250
Indirect Estimate (Daily)	1.54%	5.26%	2.06%	.46%
Indirect Estimate (Weekly)	.97%	7.54%	.45%	-.06

7.3 The Modified Method Results:

This method was developed by Hsia, Fuller and Kao (1994) based on Roll's method (1984). The method inferred the effective bid-ask spread from security returns by isolating the residual from the market model rather than the total return. This resolves the problem of imaginary spread estimates.[6] which biases down-wardly the estimates. The method is briefly described below (see chapter 5 for more detail).

The authors used the transfer function [Box and Jenkins (1976)] to estimate the effective bid-ask spread from security returns.

$$r_t = \alpha + \beta r_{mt} + a_t - \theta a_{t-1}$$

The transfer function model is the empirical version of the above equation[7] and is as follows:

$$r_t = \alpha + \beta\ r_{mt} + (1\ -\ \theta\ B)a_t, t = 1,\ldots T$$

where B is a backward shift operator (i.e., $B_t = a_{t-1}, B^2 a_t = a_{t-2}$, and so forth) and T is the time series sample size .

In order to complete the procedures for estimation for the spread we have to first get the value of $\hat{S}$ (the spread estimate) for the whole sample period from the above equation and that is obtained by constraining the value of θ to be 1. Then the value of $\hat{S}_T$ is equal to $2\hat{\sigma}_T$:

where the σ_T is the estimate of the standard deviation of white noise for the whole sample period (from $r_t = \alpha + \beta r_{mt} + a_t - \theta a_{t-1}$). Second, the value of $\hat{S}_T$ need to be normalised as the following equation describes here:

$$\hat{S} = \hat{S}_T / \sqrt{T}$$

The $\hat{S}$ given here is the final step for estimating the effective bid-ask spread from the modified method.

The section will continue to present the results of this modified method as applied to the four Gulf Markets shown in table 7-6 and figure 7-1 and then move on to make a comparison with the results of Hsia et al.

Table 7-6 shows the daily, weekly and monthly spread estimates. The results are described as follow:

1) The mean spread estimates for the daily data sets are; .948% for Kuwait, .907% for Saudi Arabia, .882% for Bahrain and .671% for Oman.

2) The estimates of the mean spread obtained from the weekly data are; .983% for Kuwait, 2.02% for Saudi Arabia, .882% for Bahrain and .791% for Oman.

Table 7-6: The Mean Spread Estimates of the Daily, Weekly and Monthly Data

Country	Daily Spread Estimate	Weekly Spread Estimate	Monthly Spread Estimate	Average Spread Estimate
Kuwait	.948	.983	.897	.9426
Saudi Arabia	.97	2.02	1.7	1.54
Bahrain	.882	1.498	1.109	1.163
Oman	.671	.791	.734	.732
USA	.882	.868	.873	.874

Notes:

The time series of samples sizes used in this study, T, used to transform $\tilde{S}T$ into $\tilde{S}$ are:
For daily data: T = the number of trading days for each company for the whole period.
For weekly data: T = number of trading weeks for each company for the whole period.
For monthly data: T = number of trading months.

3) The mean of monthly spread estimates are :.89% for Kuwait, 1.7% for Saudi Arabia, 1.10% for Bahrain and finally .734% for Muscat.,

4) Finally the overall average results of daily, weekly and monthly are; .942% for Kuwait, 1.54% for Saudi Arabia, 1.163% for Bahrain and .732% for Oman.

The individual results of estimating the bid-ask spread for the daily, weekly and monthly data for each company for each sample selected for each of the four Gulf Equity Market is shown in appendices No. 7-5 to 7-8.

In comparing the average results among the Gulf markets, we find that the Muscat average estimate appears to be the lowest amongst the four markets and that Saudi Arabia is the highest. One would expect that the most competitive markets would have the lowest spread, and the least competitive the widest.

To further analyse these results we have to compare the average of the estimates to the results obtained by Hsia et al. of CRSP data as in table No. 7-5 and figure 7.1 below :

Table No. 7.7: A Comparison of the Spread Estimates of the Modified Method (%)

Study	Kuwait	Saudi Arabia	Bahrain	Oman	Hsia et al. (NYSE)
Mean Spread Estimates	.942	1.52	1.163	.732	.8748

Looking at the figures above, we notice that the mean estimates spread of Muscat of .73 is actually less than .874 which is the result of Hsia et al. of NYSE The smaller volume of trading conducted in Muscat Stock Exchange

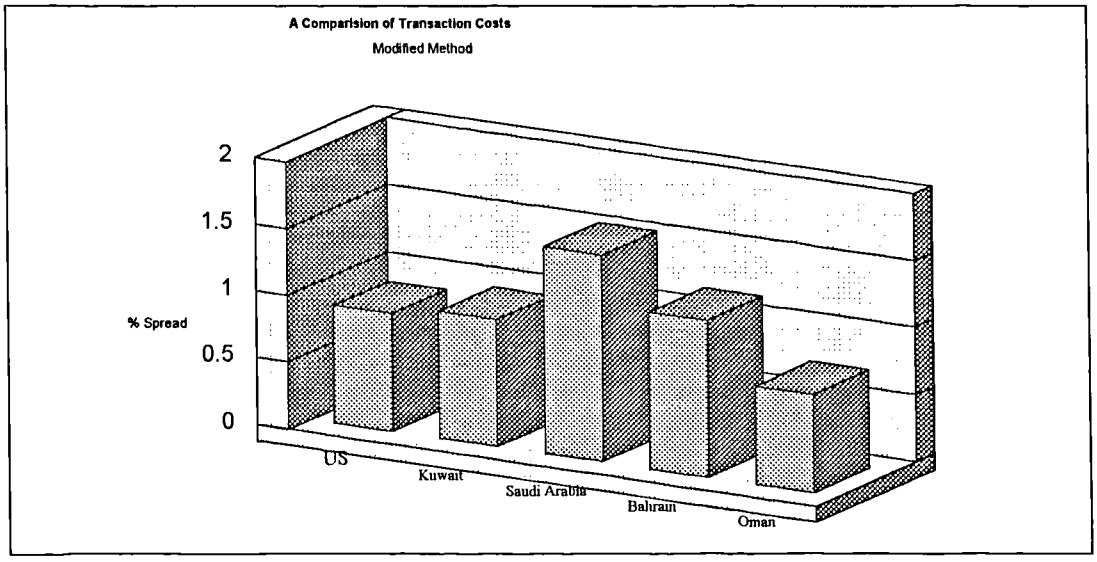
and the caution of the Omani officials to keep their market in the best possible order, [a lesson learned from the Al Manakh Crisis of Kuwait (1982)], had effected these results. Therefore, even though the market is still not a complete structure, in comparison for example with NYSE, we could still have less mean estimates of the spread which has just been discussed.

Other Gulf markets are shown to have a wider spread estimates than NYSE with the Saudi Market having almost double of the mean estimates. The cause we understand of this result is the nature of the market structure of Saudi Arabia as was explained in chapter two (The Structure of the Gulf Equity Markets), in particular trade is done only through the commercial banks in the capital Riyadh, resulting in accumulating the orders either from other cities in the Saudi Kingdom or from the city of Riyadh itself.

The results of the Bahrain market as shown by the mean estimate is more than 130% of the effective bid-ask spread obtained from NYSE.

The results from Kuwait seem to be the closest to Hsia et al. obtained from their data of NYSE. The market seems to be stationary, benefiting from the experience of Al-Manakh and also the effect of keeping the market in order which has been the goal of officials achieved through specific means i.e. the effect of the semi-market makers: Securities Group and The Securities House.

Figure No. 7.2: A Comparison of the Transaction Costs between the Gulf and US



7.4 Conclusion:

The chapter dealt with the estimation of the effective bid-ask spread from the time series of the share prices. The first method had inferred the effective bid-ask spread from the square root of the serial covariance and the second one by inferring the spread from the error term in the market model applied on share returns.

Applying the Roll model (1984) for estimating the bid-ask spread on the four Gulf Markets, the results showed high values of spread for the daily data and less spread values for the weekly data. Among these markets, we find that Muscat had the least estimate of the bid-ask spread and Saudi Arabia has the highest spread. This implies as in Roll's finding informational inefficiency or very short-term nonstationarity.

The spread is negatively related to the size for the four markets as in Roll's method results. We further investigated the relation between the spread and

the frequency of trading. The results show that the spread is slightly negatively related to the frequency of trading.

The direct estimation of the effective spread obtained from the professional people showed results which vary from those obtained from Roll's model. This casts a doubt on either the model or on the fact that the direct result of estimating the effective bid-ask spread.

The modified method applied reveals results that are consistent with Roll's method. Again we find that the Muscat market average of .732% for the spread is the lowest of all the Gulf markets.

The result of the modified method adopted here is consistent with NYSE result. The spread estimated by this method seem to vary from one market to another principally depending on the market trading activity and its structure, but Saudi Arabia is the most expensive market in which to trade.

The size of the bid-ask spread is important factor for any research on semi-strong efficiency, since it presents a lower bound on the accuracy with which price reactions can be measured[8]. That is subtle signals, which cause a returns response of under 1% cannot be distinguished from the micro market variations due to the bid-ask spread.

Notes to Chapter 7

[1] Source: Cohen, K. J., S. F. Maier, R. A. Schwartz and D. K. Whitcomb, (1986), *The Microstructure of Securities Markets*,Prentice-Hall, Englewood Cliffs, New Jersy.

[2] See appendices No.7-1 to 7-4 for spread estimates for each sample of each market.

[3] See appendices No. 7-4 to 7-8 for spread estimates of the modified method for selected companies of each market.

[4] Chi-Cheng Hisa et al., op. cit.

[5] From the bid and offer prices that were obtained the average price was .5 (Offer+Bid), the spread was (offer-bid) and the percentage spread calculated as the ratio.

[6] Chi-Cheng Hsia, p 243.

[7] Chi-cheng Hsia et. al, p. 247.

[8] In relating the transactions costs to the explaination of anaomolous, Ball (1992) stated first it is unclear the role of the transactions costs in any definition of market efficiency. For example, a predictable abnormal return of 2.5% would be treated as evidence of inefficiency at 2% costs of transacting, but not if the cost increased to 3%. Second, it might predict a delay price response to the information in cases where costs inhibit trading upon its announcement. For instance, when good (bad) earnings news that implies price increases (decreases) of less than 2% might not generate transactions when cost of trading is 2%.

Chapter VIII: Conclusion and Policy Implications

8.1: Introduction

The purpose of this study is to evaluate the development, structure and the performance of the Gulf Equity Markets. Among the developing countries, the Gulf countries have experienced the transformation of their economies within a short period of time and as a consequence their equity markets have undergone rapid and extensive changes. The importance of the Gulf countries in the world economy is growing, and an understanding of the nature and the character of the Gulf Equity Markets and their place among other world equity markets is of great relevance to academics, international investors, financial managers, government policy makers and others. This chapter brings together the major findings from which we make several policy recommendations. The chapter reviews the limitations of this study and suggests direction for future research .

Chapter two which traces the development and the structure of the Gulf Equity Markets, gave historical description of the evolvement of these markets. The co-evolution of the Gulf markets reflected similar stages in their economies. At the beginning during the first stage, there was an establishment of necessary basic industries and small companies to meet the increased demand for goods and services. There was no capital shortage, and the industry did not require an organised market. Later the number of companies increased and greater interest was given to share investment which has also been reflected by increasing the volume of trading. More recently formal legislation has formed and organised official places for share

trading in each of these four countries. An account was given to the structure for each of the organised markets of Kuwait, Bahrain and Oman as well as the unorganised equity market of Saudi Arabia. The difference of Saudi Arabia from other Gulf countries becomes even more evidence in the empirical properties of the markets.

Chapter three provided a literature review of the market efficiency which sets out the theoretical issues and assumptions of the tests applied some of which were adopted in this thesis.

The basic tests of financial economics are to investigate whether or not these markets conform to the weak form of the efficient market hypothesis which states at a minimum that the history of stock prices cannot provide information that can be used to predict their movement in future. If prices quickly react, and quickly impound price relevant information, then security prices are efficient signals for resource allocation and offer a "fair game" to investors. An innovation in this study was to give an attention to estimating bid-ask spread which is to measure the transaction costs involved in dealing in these markets. The value of these results lies in:

a) Adding to the existing literature on comparative stock markets in particular and the weak form efficiency in general.

b) Examining the hypothesis of the claim that developing stock markets (thin) conforms to the weak form of the efficient market hypothesis.

c) Examining differences in dealing costs in these markets.

d) Focusing the attention of the policy makers and administrators of these stock markets to problem (or problems) which might exists in these markets.

Chapter Four provides a comparison of the obstacles for growth and investment amongst the four Gulf markets. Due to the lack of written material, it was necessary to undertake a direct survey interviewing important people in different institutions in all the four countries. The conclusion of the survey interviewing led us to say that these markets share many similarities demonstrated by the similarity of suggestions for improvements in the opinions of interviewees from each market. Where there were differences in attitudes, it was in the Saudi Arabia market where particularly the younger market participants appeared to be more conservative and saw less need for growth than in the other Gulf economies.

Chapter five gave a description of how, security prices were collected, transformed and adjusted. Then the methodology employed to interrogate the data for this study was explained.

In chapters six and seven we discussed the results of the analysis of serial correlation, the runs tests, tests for day-of-the-week effects and the estimation of the effective bid-ask spread.

Chapter six set out the results for independence, randomness and the day-of-the week effect. The serial correlation tests results of lag 1 of the daily log prices showed that the Kuwait, Saudi Arabia and Bahrain markets have dependency. The Muscat daily prices on the other hand showed less dependency. In the serial correlation test, the importance of price

dependence has not declined significantly as the lag is increased by two, three, four, five and ten days for Kuwait, Saudi Arabia and Bahrain.

The results of the runs test of lag 1 of the daily log prices from the samples selected from each market gave a much clearer picture of dependency. The absolute mean of K standardised values (runs test) for all the four market show non randomness of data.

The behaviour of all the four markets did not conform to the normal distribution. The average of frequency distribution of data of share price changes of these markets was shown to have flat tails combined with peakdeness or leptokurtosis. Tests for the kurtosis show that the daily returns of the sample for the four markets are more peaked than normal distributions. The symmetry of the distribution, as measured by skewness coefficient, indicates the daily returns are skewed.

These descriptive statistics demonstrate that there are too many small price changes, that changes occur in small steps, and as abrupt jumps, and that there are much fewer price falls than would be expected in an informationally efficient market. These give all characteristics of administrated or managed prices, rather than market prices.

The logarithm of the daily prices were used to detect the day-of-the week effect, and the results show that the market of Kuwait, Bahrain and Oman have no particular day effect. However, in the Saudi market results of the dummy variables regression for the two sub-periods tested shows a pattern for the returns due the day-of-the week effect. This phenomenon is unlike any

encountered in the literature, since it is a positive return prior to the weekend. The classic day of the week effect is a negative return on Monday conjectured to be due to the tendency to release bad news over the weekend.

Chapter seven investigated the bid-ask spread for the four countries. The results shows that the spread is to vary between the four markets. The Muscat market results shows less spread than other three Gulf markets. In fact the estimates for Muscat showed less spread than in comparison NYSE. The spread estimates vary with the size of company and thinness of trading in the expected way. The Saudi market had a transaction cost 2 to 3 times larger than the next estimate.

8.2: Common Factors Effects

We move on to explain the common factors in the four markets which we think have had an effect on the results of the dependence and randomness of share prices, and to a certain extent to day-of-the week test, effective bid-ask spread measurements on this study and these are as follows.

a) The Thinness of the market.

It is noticeable that on the four markets the number of actual shares traded by the public are small in comparison to the related shares listed on each market. This is due to the large stock ownership by big individual investors and the government. It is believed among investors that the influence of big investors on setting the share prices (especially the Saudi market) was considerable during the period tested. The influence of government was an issue which survey respondents were particularly aware.

b) The Infrequency of Share Trading:

The infrequency of share trading is noticeable on the samples selected for the Gulf markets during the period studied and is more observed on some sectors of the markets than others.

c) Insider Trading:

The possibility of the existence of insider trading in the four markets cannot be ignored and this is supported by the comments of the respondents of the interview survey on each market and also the reliance of the authorities in each market to use moral persuasion rather than the legal power.

d) Rumour Effect on the Market:

Market prices are usually driven by rumours[1] that are not based on correct information. The disclosure of information does not seem to have significant effect on many cases of the share prices in the four markets, especially the Saudi Market.

8.3 Implications of the study:

There are implications of this study for firms, investors and authorities bodies of each market as well as researchers. We will now proceed now with the implications to firms.

Firstly, the implications for firms, when the prices are not on the suggested equilibrium, the economic growth of the country might suffer. Qualified firms might not receive a fair price for their newly issued securities.

The tests of the weak form efficiency showed the results that the current price of the traded stocks of the traded companies in the four markets did not reflect past price information available. As a result the newly issued securities that provide the foundation for economic growth may not be fairly priced on these markets. The companies with potential in this case offering higher returns for the risk involved may receive lower price for their newly issued securities and this in turn would hurt the economic growth and lead the economy to perform less or not reach its potential level.

Second, such inefficiencies could be an encouraging factor which would lead investors to (a) search for under priced securities (b) develop trading strategies.

The stock prices changes were systematic as the runs tests results revealed and that would encourage investors to adopt a trading strategy. When the change of price of stock for one day tend to be followed by a change in price on the same sign on the following day investors would adopt a trading strategy based on the sign of the change (buying or selling) which might generate profit.

The existence of non-randomness on the other hand could be discouraging for investors. The non-randomness of stock price changes raises the question about the market's confidence. In this case, investors might be

hesitant to enter this market because they might feel that the pricing mechanism of the market is driven mainly by manipulation rather than by related and reliable market information.

Also, the relatively high bid-ask price , as we evidenced from the results of the four markets, when added to other transaction costs (taxes by the stock exchange and commissions by brokers) might lead the investors to think that the stock market is an expensive market to deal with. As a result the investors may not deal in the stock market or look for other stock markets where the transaction costs (the effective bid-ask price) is more competitive and that will ultimately affect the performance and activity of these markets.

The implications for policy makers in each of the four markets should be to the following three areas as it seen in the four markets:

1) The lack of liquidity in the secondary market (thin trading) for most of the stocks traded seems to be one of the main problems that professional investors face when they consider these securities as an investment alternative. This problem can be reduced with the introduction of short selling procedures or it can be eliminated with the implementation of specialists who stand ready to buy/sell at market prices when there are no sellers/buyers.

2) Hedging against risks can encourage investors to enter the market and that by introducing options. Also, having preferred[2] stocks will permit more participants in the market.

3) The fixed commission set by the authorities in all the four markets is partially responsible for the high concentration of transactions among very few brokerage companies or banks' units of share trading as in the Saudi market. That is, an investor who wants to buy traded stock will select that broker company which offers a better service in terms of advice, information and time of execution. This puts small member firms and brokers at a disadvantage. The government does not need to fix the transaction costs, only the maximum.

For researchers applying and testing the developing markets (emerging) using models that have been developed and tested in developed markets one has to give greater consideration to the specific environment of these markets (in our case study the targeted countries are Islamic countries with a different social attitude ultimately has an effect on saving and investing decisions).

8.4: General Policy Recommendation:

Since these four countries built a sophisticated economic infrastructure during the years of surplus oil revenues and good developed stock markets can play a vital role on the Gulf's countries continuing economic development. To achieve this many improvements could be brought to these markets by harmonising and linking them which would have a direct and positive effect on their operational and pricing efficiency.

8.4.1: The Prospective Role of Gulf Investment Corporation

The above mentioned process could be achieved through a specialised organisation which is acceptable to all the involved markets in the GCC countries as in the case of the Gulf Corporation for Investment (GCI) whose

main role is to direct investments in new ventures and offer a wide range of financial services in the area of corporate finance, trade finance, treasury capital markets, investment banking and institution asset management and all of that which is necessary to support the cause of economic growth and development in the GCC region.

There exists a legislation for Economic integration between the GCC countries that was signed in June 1981 this includes a clause which allows GCC citizens to buy and sell shares in Member Countries. What makes this corporation unique is its ability to gradually link and harmonise these markets , due to the fact that it is being equally owned by the GCC countries with a nominal capital of $ 2.1 billion and this could entitles it to fulfil the proposed rule as suggested here with the full consent of its members.

Having the Gulf Corporation for Investment to perform the task of linking and harmonising these markets could bring the following advantages; increasing the number of participants, increasing the markets capitalisation, increasing the volume of initial public offerings, reducing speculation, increasing available options to investors, improving the quality of information available in these markets, reducing the transaction costs (effective bid-ask spread) and ultimately it will improve the efficiency of these markets which will have an effect on the overall development process.

A prior direct agreement is needed between the GIC and the concerned authorities - SAMA (Saudi Arabia), Oman Securities Markets (Oman), Bahrain Securities Market (Bahrain) and Kuwait Securities Market (Kuwait).

The policy recommendations which would lead toward the favoured prospective role for the GCI are as follows;

a - Linking all the trading system of the four Equity markets which will enable investors of the Gulf to have information related to trading about other markets and will ultimately lead to more choice in setting their own portfolio.

b - Creating a data base for these markets which would make a comprehensive information available to investors, whether they are interested individuals or any local bodies .

c - A process of gradual harmonisation of regulations is needed between the four Equity markets.

d - Establish more than one index for each country (weighted and equally weighted index) which will enable investors to compare the performance of these Equity markets. Also, establish two representative indexes for all these markets to reflect the performance of all the Gulf Equity markets.

e - Increase the proportion of ownership by any of the GCC citizens to 40%[3] and to an agreeable percentage for international investors. With the exception of three Gulf markets, presently there is not an explicit law for GCC citizens to own stocks in the Saudi market.

f - Establish specialised periodical magazines which cover and analyse the information and news of each market. This should improve the investor's awareness.

g) Design a unified system of supervision through co-operation with the regulatory bodies in these countries and extend it the other two unofficial stock markets of Qatar and United Arab Emirates (Very recently, there has been announcements from the official bodied in Qatar and U.A.E. of considering an establishment of Stock Exchanges).

h) Harmonise the listing requirements among those markets and the listing requirement for foreign companies.

i) Introduce new investment techniques and instruments which are currently being used in mature and developed markets such as short selling, margin accounts and options. Even though these are widely thought to be a cause for speculation in these markets, the advantages of stabilising the market through these means outweigh the disadvantages which are feared[4].

j) Establish investment banks and market markers to work in these markets and that will organise the initial public offering in the primary market and will make it accessible to the citizens of the Gulf. The existence of market makers will also contribute in making these market more stable, minimise the transaction costs and reduce the speculation which is shared by all the Gulf markets.

k) Adopt a unified minimum standard of accounting and disclosure of information for traded companies in each market.

l) Establish a central depository system for all the Gulf markets with agreed conditions among these markets which will enhance the settlement process.

Investors will have their accounts settled faster with less time consumed for any investor who wants to trade in any of the other GCC markets.

m) Establish a mutual fund company(s) with equal participation from the GCC citizens for the purpose of investing in the share of traded companies of the Gulf markets.

n) Establish training centres for the members and staff of these markets to provide the necessary skills, update staff and share experiences.

o) Link these markets with the outside world. Even though currently some of these markets are linked with Reuters, the information supplied is still limited to the prices and the volume of trading. Therefore, more comprehensive data is needed to be made available for international investors through linking them to information systems such as Reuters.

p) Harmonise price quotation techniques among the Gulf markets through their linked trading system.

q) Develop research centres that will be able to keep pace with the theoretical framework of the capital markets and apply the needed empirical work in these markets.

r) Develop plans for the privatisation of the Gulf Governments' quotas in the four equity markets. For example, the Saudi Government total ownership of the equity market is around 47% and similar percentage by the Kuwait Government.

Certainly the above recommendations which are suggested do not stand as a complete model to be imposed on the Gulf equity markets so much as they are suggestions to improve the performance of the Gulf market. However, once adopted for a period of time it would be possible to encourage on them to reach a level of harmonisation which might lead to a way of integration between these markets after sorting out many matters of the economic integration and especially the monetary policy.

8.5: Limitation of the Study

Field trips were conducted to collect the raw data and conduct survey interviewing. The interviewing was a difficult process when dealing with four countries, even though the researcher is from one of these countries - Kuwait. Interviewing considered to be the best method for this research to get the primary data since there is not enough material written available. There are limitations such as the number of interviewees and their availability. However, a sufficient significant number of interviewees from different related background were included. Another limitation of Interviewing is that it is an unreliable method of data collection since respondents have a tendency to tell the interviewer what they think he wants to hear.

The availability of the data on computer readable files was also a major obstacle for the research. Ideas which may have been applied to a pre-existing database had to be limited because the priority was given to the creation of the database.

The study is thus limited by the sources which are available and by the changes occurred within a short period of time, particularly during and after the Gulf war of 1991.

The methodologies used to test for the weak form efficiency, day-of-the week effect and estimating for the bid-ask spread all have its limitation and also the results discussed and drawn are based on the samples chosen from each market.

8.5: Suggestion for Further Research.

Given the limited resources available for this research, this work ended with many areas waiting for further research. The number of areas opened up by this research include the following: first, conduct similar tests on a different time period. For example, an analysis of a different time segment of this study would be appropriate to determine if the results are the same as those found in this study. Further research covering the subsequent following periods would be valuable as they might detect any possible improvement in the efficiency of these markets, especially that these markets continue to witness changes.

Second, a relevant study of the semi-strong form of efficiency is appropriate be applied on the Gulf Stock markets taking for instance, the reaction of the markets to dividends, stock split and annual report.

Third, since there is non randomness, various trading strategies could be examined to determine their profitability.

Fourth, it would be possible to investigate the effects of different factors as in multifactor models looking at different variables such as interest rates, rate of inflation, money supply, oil production to test their effect on the share returns in each market of the Gulf.

Fifth, detection of the day-of-the week effect and month-of the year effect on the Gulf Equity markets could be applied if a longer time series of data could be developed. A more comprehensive data base would make it also possible to test for other anomalies such as the small firm effect and the price earnings effect.

Notes to Chapter 8

1 As we gathered from our interview survey conducted.
2 In 1994, Royal Decree in Saudi Arabia was issued to give a permission to the traded companies to issue preferred stocks.
3 After the survey was conducted, a permission was given to GCC citizen of around 49% in Kuwait.
4 As reflected by many of the interviewees' opinion.

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Appendix No. 2.1 :Relevant Statistics of the Gulf Countries

Country	Population (millions)	Population Growth	Oil Production (mb/d)	Oil Revenues U.S.Dollar	% of Oil Rvenues in Government Revenues	% of Oil Exports in Total Exports	% of Oil Growth in Non-OIl GDP	Oil Reserves. (bn barrells)	Total Reserves including Gold in Million of U.S. Dollar
Saudi Arabia	14.4	3.5%	5.250	25,350	63.3%	86.2%	4.6%	252.4	16,959
Kuwait	1.9	3%	1.753	8,922	83.11%	83.7%	3.6%	94.5%	3,211
U.A.E.	1.731	3.3%	1.910	10,359	69.5%	87.5%	5%	98.1	4,639
Oman	1.58	3.4	.616	3,540	83.7%	87.9%	23%	4.1%	1,423
Bahrain	.472	4.5%	.043	652	57%	41.6%	3.5%	.11	1.051
Qatar	.389	2.7%	.330	2,249	88%	90%	2.5%	3.15	575

Source: Gulf International Bank, "Gulf Economic Indicators: 1990", Gulf Economic & Financial Report, Issue No. 10 Vol.V, December 1990

Appendix No. 4.1: Survey of the Gulf Equity Markets.

Survey of the Gulf Equity Markets: The Case of Kuwait, Saudi Arabia, Bahrain and Oman.

Mesfer Al-Ajmi

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University of Warwick

This survey is a part of a study on the Gulf Equity Markets: Their Structure and Performance. The purpose of the investigation is to assess the general factors which are regarded as obstacles to the investment and growth on each market. This analysis will hopefully lead to improvements of the Performance of the Gulf Equity Markets.

Part I:

Name of the respondent:

Position:

Name of the company or organisation:

Type of Organisation:

Broker [ ] Fund Manager [ ]

Market Regulator [ ] Private Investor [ ]

Other:

How many years have you worked in this role?

Under three years [ ] 3-7 Years [ ]

More than 7 years [ ]

Part II:

Below are several factors which will help in assessing any problems with each stock market based on your experience of the current market structure, please indicate (on a five point scale) the degree of your agreement as follows:

Strongly Agree Undecided Disagree Strongly Agree Disagree

1)The need to increase the size of the market.

Q1a) To further develop the market, we need to increase the number of companies currently operating in the market.

1 2 3 4 5

Q1b) To develop the markets we need to allow GCC companies to be listed.

1 2 3 4 5

Q1c) The market should be expanded to allow Non-GCC companies to be listed in the market.

1 2 3 4 5

Q1d) GCC citizens should be allowed to have a higher percentage of direct ownership of shares.

1 2 3 4 5

Q1e) Non-GCC citizens should be allowed to own shares.

1 2 3 4 5

Q1f) Indirect ownership of shares (e.g. International Funds) should be encouraged.

1 2 3 4 5

Q1g) No need is seen to increase the present size of the market

1 2 3 4 5

2) The need for investors to be aware of the investments available in the market.

Q2a) Informational facilities concerning stock market activity should be extended - to television coverage for example.

1 2 3 4 5

Q2b) Company disclosures should be made through more than one media , and in a way that is intelligible to all types of investor.

1 2 3 4 5

Q2c) Informational plan to arouse public awareness should be implemented, and introduced at the earlier stages of education.

1 2 3 4 5

3) The need additionally surfaced to update and maintain the legal frame-work was broken down to:

Q3a) The government should do more to encourage investments and confidence in the market through suitable means.

1 2 3 4 5

Q3b) The legal framework should be changed.

1 2 3 4 5

4) The need to reduce the importance of insider information by regulation.

Q4a) Speculation dependant on inside information must be discouraged.

1 2 3 4 5

Q4b) There should be strict enactment of insider law.

1 2 3 4 5

5) Current accounting standards and practises.

Q5a) There should be a local proficiency test for the accountants working in auditing offices.

1 2 3 4 5

Q5b) Companies' annual reports and other financial information should be standardised.

1 2 3 4 5

Q5c) Companies need to adopt one specific international accounting standards.

1 2 3 4 5

6) The need to increase the volume of information available on the market:

A) Corporation

I) Corporate financial statements should be improved

1 2 3 4 5

I) Management commentary in corporate reports should be increased.

1 2 3 4 5

III) Investment analyst contact with corporate management should be increased.

1 2 3 4 5

B) Publishing Media:

I) Daily newspapers should provide financial analysis of the market on a regular basis.

1 2 3 4 5

II) The number of business magazines both weekly and monthly should be increased.

1 2 3 4 5

III) There should be greater advertising of financial services.

C) Other Published Financial Services:

I) Government agencies and officials do provide thorough financial information about the market.

1 2 3 4 5

II) The current stock market analysis and dissemination of information is already sufficiently comprehensive and updated

1 2 3 4 5

7) Transaction costs of the traded shares on the market.

A) There is a need to reduce the rate of commission charged by stock brokers.

1 2 3 4 5

B) The size of the share prices' spread available in the market is wide in comparison with other markets.

1 2 3 4 5

8) The need for specialised financial institutions and new financial instruments is based on each market stage and need.

A) The importance of specialised financial institutions to complement the function of the stock market.

I) The need for investment banks.

1 2 3 4 5

II) The need for market makers.

1 2 3 4 5

III) The need for unit investment trust.

1 2 3 4 5

IV) The need for lessening of time for settlement.

1 2 3 4 5

V) The need for clearing houses.

1 2 3 4 5

Other elements you might suggest:

B) The availability of a range of financial instruments and methods of trading gives investors a better chance of choosing their own portfolio.

I) The need for convertible bonds.

1 2 3 4 5

II) The need for short selling.

1 2 3 4 5

III) The need for margin account.

1 2 3 4 5

IV) The need for an option market.

1 2 3 4 5

V) The need for preferred stocks.

1 2 3 4 5

Other elements you might suggest:

9) The return available on the investments on the market.

A) The return available on investments on the market.

A) The return offered in the equity market is low.

B) Government subsidies affect the return in certain sectors of the market.

C) The size of government ownership has an effect on the return of some companies traded in the market.

Part III:

We have been through a range of factors that need to be taken into account for the development of the stock markets both in developing countries as well as regulated and mature markets such as New York or London. Could you rank these factors in order of their importance that might affect the role and the performance of the stock markets in the Gulf.

'Please number the following statements according to their degree of importance. The most important item should be numbered 1, the next most important numbered 2 and so on...'

1) The need to increase the size of the market. [ ]

2) The need for investors to be aware of investment available. [ ]

3) The need to update and maintain the legal frame-work in the market. [ ]

4) The need to reduce the importance of the insider information by regulation. [ ]

5) The need to improve current accounting standards [ ]

6) The need to increase the volume of information available in the market. [ ]

7) The need to reduce the transaction costs associated with [ ].

8) The need for new financial instruments. [ ]

9) The need for specialise financial institutions [ ]

10) Return offered on investments available on comparison with other equity markets. [ ]

Part IV:

"There are many factors which make for a successful stock exchange. What do you consider to be the main obstacles to develop the gulf markets as important and successful stock exchanges.? please list?"

Appendix No. 4.2 : Survey Interview Analysis Programme

```
options pagesize=66;
proc format;
   value country
   1 = 'Kuwait'
   2 = 'Saudi Arabia'
   3 = 'Bahrain'
   4 = 'Oman';
   value years
   1 = 'under three years'
   2 = '3-7 years'
   3 = 'more than 7 years';
   value job
   1 = 'Broker'
   2 = 'Fund manager'
   3 = 'Market regulator'
   4 = 'Private investor'
   5 = 'Other' ;
   value likert
   1-2 = 'Agree'
   3   = 'Undecided'
   4-5 = 'Disagree'  ;
run;
data Saudi;
input
country 1 job 2 years 3 q1a 4 q1b 5 q1c 6 q1d 7 q1e 8 q1f 9
  q1g 10 q2a 11 q2b 12 q2c 13 q3a 14 q3b 15 q4a 16 q4b 17 q5a 18
  q5b 19 q5c 20 q6a1 21 q6a2 22 q6a3 23 q6b1 24 q6b2 25 q6b3 26
  q6c1 27 q6c2 28 q7a 29 q7b 30 q8a1 31 q8a2 32 q8a3 33 q8a4 34
  q8a5 35 q8b1 36 q8b2 37 q8b3 38 q8b4 39 q8b5 40 q9a 41 q9b 42
  q9c 43 q10_1 44-45 q10_2 46-47 q10_3 48-49 q10_4 50-51 q10_5 52-53
  q10_6  54-55 q10_7 56-57 q10_8 58-59 q10_9  60-61 q10_10 62-63
;
cards;
;
run;

proc freq;
  label q1a ='Increase the number of companies'
        q1b ='Allow GCC countries companies listed'
        q1c ='Allow Non-GCC companies to be listed'
        q1d ='Allow GCC countries to own more shares'
        q1e ='Allow Non-GCC citizens to own shares'
```

```
q1f ='Allow International Funds'
q1g ='I see no need to increase the size'
q2a ='Etablish an informational plan'
q2b ='Co.disclosure in more than one media'
q2c ='Public awarness plan at earlier stages'
q3a ='Gov. should encourage invest & confid'
q3b ='The legal framework should be changed'
q4a ='Speculation should be discouraged'
q4b ='Enactment of insider information law'
q5a ='Professional test for accountants'
q5b ='Standarisation of Co. finan reports'
q5c ='Adopt international accounting stand.'
q6a1='Financial statement should be improved'
q6a2='Increase management commentary on stat'
q6a3='Increase invest. analysts contacts'
q6b1='Daily newspapers increase finan. anal.'
q6b2='Increase No. of business newspapers'
q6b3='Greator advertis. of finan services'
q6c1='Gov. agencies provide enough finan.Infor'
q6c2='Stcok market analysis is comperhensive'
q7a ='Reduce brokers" commission'
q7b ='Share prices" spread is wide'
q8a1='Need for investment bank'
q8a2='Need for market maker'
q8a3='Need for unit invest. trust'
q8a4='Need for lessening the settlement time'
q8a5='Need for a clearing house'
q8b1='Need for convertable bonds'
q8b2='Need for short selling'
q8b3='Need for margin account'
q8b4='Need for an option market'
q8b5='Need for preferred stocks'
q9a ='Market return is low'
q9b ='Gov. subsidies affect the return'
q9c ='Size of Gov. ownership affect return'
q10_1='Increase the size of market'
q10_2='Awarness of investment available'
q10_3='Update legal framework'
q10_4='Enactment of insider information law'
q10_5='Improve current accounting standards'
q10_6='Increase volume of information'
q10_7='Reduce transaction cost'
q10_8='Need for new financial instruments'
q10_9='Need for specialised financial instits'
q10_10='Return available on the market';
```

```
  format country country. years years. job job. ;
  format q1a likert. q1b likert. q1c likert. q1g likert.;
  tables  country*job (q1a q1b q1c q1g)*country /norow nocol nocum
       nopercent  CHISQ;
/* tables  country*job (q1a q1b q1c q1g)*country /
        chisq noprint;    */
 run;     /*

/**************************bar chart **************************/

proc format;
   value likertx
   1-2 = 'Agree'
   3-5 = 'Disagree' ;
run;

%macro fr(hvar);

proc freq data = saudi;
  tables &hvar*country / out = fre1;
  format &hvar  likertx.;
run;

goptions
  chartype = 5
  dev = cgmwpl
  cback = white
  colors = (black)
  gsfmode = replace
  gaccess ='sasgastd>out.cgm'
;
/*goptions dev = vga cback = white colors = (black);*/
/*goptions dev = psl
       rotate
       gsfmode = replace
       gaccess ='sasgastd>out.ps'
       gprolog = '2521200A'x
       cback = white
       colors = (black); */
title h = 1.5 "&hvar";
proc freq data = saudi; tables q1a*country; run;
/*pattern1 v = e color = black ;*/
pattern1 v = x color = black;
pattern2 v = s color = black;
```

```
 axis1 value = (h=1.0)
      label = (h=1.0);
 axis2 value = (h=1.0)
      label = (h=1.0);
 axis3 value = (h=1.0)
      label = (h=1.0);

 proc gchart data = fre1 ;
   format country country. ;
   format &hvar  likertx.;

  hbar q1a/SUMVAR=count sum discrete
         group = country
         patternid = midpoint
         maxis = axis3
         raxis = axis2
         gaxis = axis1
         space = 0
             ;
run;
%mend;

%fr(q1a);

/*******************mean report *********************/

proc sort data = saudi;
  by country;
proc means;
   by country;
   var q10_1-q10_10;
   output out = cmeans  mean = cmean1-cmean10 sum = csum1-csum10
n=nobs;
  format country country. ;
   label  q10_1='Increase the size of market';
run;
proc print data = cmeans; run;

proc format;
   value numfmt
   1 = ' one  '
   2 = ' two  '
   3 = ' three'
   4 = ' four '
   5 = ' five '
```

```
    6 = '  six  '
    7 = '  seven'
    8 = '  eight'
    9 = '  nine '
    10 = '  ten  ';

filename f1 'rank.rpt';

data _null_;
  file f1;
  put / @1 'This is the general Title';
run;

%macro me(cnum);

data s1 (keep = cmean value country);
   set cmeans;
   if country = &cnum then do;
      array cc(10) cmean1-cmean10;
      do i = 1 to 10;
        value = cc(i);
        cmean = i;
        output;
      end;
   end;
run;
proc sort; by value;


data _null_;
  length m1-m10 $7;
  retain l1 - l10 m1 - m10;
  array lin2(10) l1-l10;
  array lin3(10) m1-m10;
  array lin1(10) n1-n10;
  set s1 end = eof;
   do i = 1 to 10;
        lin1(i) = i;
   end;
  if _n_ = 1 then do;
    file f1 mod;
    put // @1 country  /;
    put @1 (n1 - n10) (7.-C);
    put 70*'_';
  end;
```

```
   p+1;
   lin2(p) = round(value,.001);
   lin3(p) = put(cmean,numfmt.);
    if eof = 1 then do;
       file f1 mod;
       put (l1-l10) (7.3) ;
       put ' ';
       put (m1 - m10) ($7.) ;
    end;
run;
%mend;

%me(1);
%me(2);
%me(3);
%me(4);
□
```

Appendix No. 6.1(a) : The Empirical Distribution Programme

```
proc format;
  value pfmt
   1 = '-6'
   2 = '-5'
   3 = '-4'
   4 = '-3'
   5 = '-2'
   6 = '-1'
   7 = '1'
   8 = '2'
   9 = '3'
   10 = '4'
   11 = '5';
 options linesize = 80;
 %macro lims (set1,bvar,svar);
    proc sort data = assign; by &bvar; run;
    proc means data=&set1;
       by &bvar;
       var res;
       output out = outa mean = m std = s n = count;
    run;
    proc means data=&set1;
       var res;
```

```
   output out = outb mean = m std = s n = count;
run;
data outb;
  set outb;
  company = 'all';
run;
proc append base = outb data = outa force;
run;
data limits (keep =  company m s mmin1-mmin5 mplus1-mplus5 mval)
    limits2 (keep =  m mmin1-mmin5 mplus1-mplus5 mval);
 retain mval 1;
 set outb;
 array limits(10) mmin1-mmin5 mplus1-mplus5;
 do i = 1 to 5;
   limits(i)= m - (s*i);
 end;
 do i = 6 to 10;
   limits(i)= m + (s*(i-5));
 end;
 if company = 'all' then do;
   output limits2;
end;
 else output limits;
run;
data merged;
```

```
 merge &set1 limits;
 by &bvar;
run;
proc datasets library = work;
   modify limits2;
   rename  mmin5= amin5 mmin4 = amin4  mmin3 = amin3 mmires = amires
          mmin1 = amin1 m= ame
          mplus5= aplus5 mplus4 = aplus4  mplus3 = aplus3 mplus2 = aplus2
          mplus1 = aplus1 ;
run;
proc sort data = merged; by mval;
data merged;
    merge merged limits2;
    by mval; run;
data assign (drop = i found);
  set merged;
  array spread(11) mmin5 mmin4 mmin3 mmires mmin1 m mplus1-mplus5;
  array aspread(11) amin5 amin4 amin3 amires amin1 ame aplus1-aplus5;
  i = 1;
  do until(found = 1);
     i+1; found = 0;
     if i < 7 then do;
        if (&svar < spread(i)) then do;
          gp = input(put(i,pfmt.),8.);
          found = 1;
```

```
    end;
end;
else do;
    if i >11 then do ;
        &svar = mplus5;
        i = 11;
    end;
    if (&svar <= spread(i))  then do;
        gp = input(put(i,pfmt.),8.);
        found = 1;
    end;
  end;
end;
stdgp = abs(gp);
i = 1;
do until(found = 1);
   i+1; found = 0;
   if i < 7 then do;
       if (&svar < aspread(i)) then do;
          gpa = input(put(i,pfmt.),8.);
          found = 1;
       end;
    end;
    else do;
        if i >11 then do ;
```

```
            &svar = aplus5;
            i = 11;
          end;
          if (&svar <= aspread(i))  then do;
            gpa = input(put(i,pfmt.),8.);
            found = 1;
          end;
        end;
      end;
      stdgpa = abs(gpa);
    run;
title 'All Companies';
    proc freq;
      tables gpa stdgpa ;
      label gpa = 'Grouped Standard Deviations'
        stdgpa = 'Standard Deviations';
    run;
title 'Individual Companies';
    proc freq;
      by &bvar;
      tables gp stdgp;
      label gp = 'Grouped Standard Deviations'
        stdgp = 'Standard Deviations';
    run;
%mend;
```

```
%lims(all,company,res);
```

Appendix No. 6.1 (b): The Runs Test Programme

```
proc sort data=all;
by company ; run;
%macro runs(set1,bvar,svar);
  proc sort data = &set1;
      by &bvar;
  run;
  data two (keep = k &bvar i1 i2 i3 runs re sre x y numob);
     set &set1;
     by &bvar;
     retain ksign;
     if first.&bvar then do;
       ksign = 0;
       numob = 0;
       change = 0;
       i1=0; i2=0; i3=0;
     end;
     numob+1;
     if &svar>lag1(&svar) then do;
        sign=1;
        i1+1;
     end;
     if &svar = lag1(&svar) then do;
        sign = 0;
```

```
        i3+1;
      end;
      if &svar<lag1(&svar) then do;
        sign = -1;
        i2+1;
      end;
      if (sign ^= ksign and _n_ >1) then change+1;
      ksign = sign;
     if last.&bvar then do;
        N=numob; runs = change;
        x= i1**2 + i2**2 + i3**2;
        y= i1**3 + i2**3 + i3**3;
        re = (N*(N+1)-x)/N;
        sre = sqrt((x*(x+N*(N+1))-2*N*y-N**3)/(N**2*(N-1)));
        if runs>re then half = .5;
        else half = -.5;
        k = (runs-re+half)/sre;
        output;
      end;
  run;
%mend;
%runs(all,company,res);
```

Appendix No.7.1(a) : Modified Method Spread Programme

```
proc means data = all mean;
  by date;
  var n5;
  output out = meann5  mean = mn5 ;
run;
proc sort data = meann5; by date;
data new;
   merge all meann5;
   by date;
run;
proc sort data = new; by company; run;
/*
symbol interpol = rcclm95
      value = diamond;
proc gplot data = new;
  by company;
  plot n5*mn5;
run;
quit;
 */
proc reg data = new;
   by company;
   model n5=mn5;
run;
data new;
  set new;
  by company;
  if first.company then do;
     n=0;
     cumn5 = 0;
     cummn5 = 0;
 end;
 n+1;
  cumn5+n5;
  cummn5+mn5;
run;
options pagesize = 60;
proc reg data = new;
  by company;
  model cumn5 = cummn5 n / ;
run;
proc reg data = new outest=est ;
```

```
  by company;
  model cumn5 = cummn5 n / ;
run;
proc print data=est; run;
proc means data=new ; by company; output out= outn n=number; run;
data outn; set outn; drop _type_; run;
proc print data=outn ; run;
data both;
  merge est outn;  run;
data newes ;
 set both;
 RMSE = (2*_RMSE_) ;
 spread=RMSE/(sqrt(number)) ; run;
  proc print data=newes ; run;
  proc means data=newes mean ;
    var spread ; run;
```

Appendix No. 6-1(1): Empirical Distributions of Kuwait Daily Data.

STDGPA	Frequency	Percent	Frequency	Percent
0.5	6694	62.1	6694	62.1
1	2568	23.8	9262	85.9
1.5	769	7.1	10031	93.0
2	330	3.1	10361	96.1
2.5	179	1.7	10540	97.7
3	86	0.8	10626	98.5
3.5	49	0.5	10675	99.0
4	34	0.3	10709	99.3
4.5	26	0.2	10735	99.5
5	49	0.5	10784	100.0

Appendix No. 6-1(2): Weekly Empirical Frequency Distributions for Kuwait

	Frequency	Percent	Frequency	Percent
0.5	1406	60.8	1406	60.8
1	596	25.8	2002	86.6
1.5	132	5.7	2134	92.3
2	75	3.2	2209	95.5
2.5	38	1.6	2247	97.2
3	16	0.7	2263	97.9
3.5	18	0.8	2281	98.7
4	10	0.4	2291	99.1
4.5	6	0.3	2297	99.4
5	15	0.6	2312	100.0

Appendix No.6-1 (3): Daily Empirical Frequency for Saudi Arabia

STDGPA	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0.5	17146	64.4	17146	64.4
1	4405	16.6	21551	81.0
1.5	2277	8.6	23828	89.6
2	1262	4.7	25090	94.3
2.5	668	2.5	25758	96.8
3	418	1.6	26176	98.4
3.5	234	0.9	26410	99.3
4	102	0.4	26512	99.6
4.5	41	0.2	26553	99.8
5	53	0.2	26606	100.0

Appendix No.6-1 (4): Weekly Empirical Frequency for Saudi Arabia

STDGPA	Frequency	Percent	Frequency	Percent
0.5	1450	51.5	1450	51.5
1	758	26.9	2208	78.4
1.5	322	11.4	2530	89.8
2	153	5.4	2683	95.3
2.5	80	2.8	2763	98.1
3	38	1.3	2801	99.5
3.5	8	0.3	2809	99.8
4	1	0.0	2810	99.8
4.5	3	0.1	2813	99.9
5	3	0.1	2816	100.0

Appendicix No.6-1 (5): Daily Empirical Frequency Distributions for Bahrain

STDGPA	Frequency	Percent	Frequency	Percent
0.5	2837	70.2	2837	70.2
1	581	14.4	3418	84.5
1.5	236	5.8	3654	90.4
2	165	4.1	3819	94.5
2.5	113	2.8	3932	97.3
3	51	1.3	3983	98.5
3.5	31	0.8	4014	99.3
4	10	0.2	4024	99.5
4.5	11	0.3	4035	99.8
5	8	0.2	4043	100.0

Appendicix No. 6-1(6): Weekly Empirical Frequency Distributions for Bahrain

STDGPA	Frequency	Percent	Frequency	Percent
0.5	566	72.8	566	72.8
1	107	13.8	673	86.6
1.5	46	5.9	719	92.5
2	31	4.0	750	96.5
2.5	15	1.9	765	98.5
3	7	0.9	772	99.4
4	2	0.3	774	99.6
5	3	0.4	777	100.0

Appendicix No. 6-1(7): Daily Empirical Frequency Distributions for Oman

STDGPA	Frequency	Percent	Frequency	Percent
0.5	3351	69.2	3351	69.2
1	752	15.5	4103	84.7
1.5	317	6.5	4420	91.3
2	135	2.8	4555	94.1
2.5	104	2.1	4659	96.2
3	65	1.3	4724	97.5
3.5	40	0.8	4764	98.4
4	30	0.6	4794	99.0
4.5	12	0.2	4806	99.2
5	37	0.8	4843	100.0

Appendicix No. 6-1(8) :Weekly Empirical Frequency Distributions for Oman

STDGPA	Frequency	Percent	Frequency	Percent
0.5	594	73.7	594	73.7
1	111	13.8	705	87.5
1.5	42	5.2	747	92.7
2	19	2.4	766	95.0
2.5	9	1.1	775	96.2
3	12	1.5	787	97.6
3.5	7	0.9	794	98.5
4	4	0.5	798	99.0
4.5	3	0.4	801	99.4
5	5	0.6	806	100.0

Appendix No.6-2(1): Result of Serial Correlation Coefficients lag1 , 2, 3, 4, 5,10 for Kuwait Daily Data.

OBS	COMPANY	LAG1	LAG2	LAG3	LAG4	LAG5	LAG10
1	AB	-0.09332*	-0.05560	0.02739	-0.03735	0.05031	-0.031563
2	ARI	-0.18343*	0.03244	-0.06525	-0.05954	-0.06417	-0.009574
3	BB	-0.05103	0.00191	-0.00029	0.02353	0.01723	-0.042611
4	CBK	-0.12654*	0.02453	0.01738	-0.03901	0.00748	0.022798
5	CFC	-0.19241*	-0.01965	-0.00800	-0.05339	0.08413	-0.057646
6	CI	-0.05892	0.08169*	0.01286	-0.01726	0.05154	-0.005735
7	GB	-0.23064*	-0.00138	-0.07135	-0.01731	0.04760	-0.069679
8	GLFC	-0.27517*	0.03405	-0.17191*	0.22244*	-0.19633*	-0.004219
9	IINVST	-0.02716 -	0.08728	0.17248	-0.02901	0.11298*	-0.050339
10	KFH	-0.18687*	0.02704	-0.02073	0.00266	0.03299	0.086990
11	KINVST	-0.23847*	0.03947	0.08828	-0.05740	-0.02648	0.021607
12	KMB	-0.04848	0.02222	-0.00094	0.03155	-0.05139	0.022176
13	KREST	-0.05215	0.06644	-0.07947	0.06132	0.01392	0.061003
14	KRESTB	-0.01935	0.01092	0.00240	-0.04434	-0.05901	0.066864
15	MTELE	-0.11062*	-0.10153*	0.03427	0.04872	-0.02563	-0.006743
16	NBK	-0.10626*	0.10828*	0.00892	-0.00172	0.07317	-0.010260
17	NREST	-0.15056*	0.02338	0.03550	-0.10812	0.07030	0.056903
18	PHARMA	-0.04095	-0.017480	0.039468	-0.002489	-0.046698	0.017847
19	PWARH	0.14955*	-0.036419	0.003182	0.022815	0.043112	0.029047

*Significant at 5% level

Appendix No.6-2(2): Result of serial correlation Coefficients lag1 , 2, 3, 4, 5, 10 for Kuwait Weekly Data.

OBS	COMPANY	LAG1	LAG2	LAG3	LAG4	LAG5	lag10
1	AB	-0.29042*	0.10072	-0.04291	0.11050	0.04790	0.05689
2	ARI	-0.31585*	0.06040	-0.11145	0.14921	-0.08315	0.03135
3	BB	-0.17454*	0.08050	0.08748	0.07651	-0.02356	-0.0138
4	CBK	-0.17061*	0.07320	0.18347	-0.06051	-0.05528	.0.02474
5	CFC	-0.35536*	0.01162	0.02795	-0.16611	0.11733	-0.0671
6	CI	-0.01869	-0.00617	-0.07025	-0.01317	0.04777	.-0.0208
7	GB	-0.19530*	-0.02808	-0.12350	0.03526	-0.00552	-0.0833
8	GLFC	-0.34593*	0.19303*	-0.53720*	0.33214*	-0.37076*	-0.1009
9	IINVST	0.41039*	0.32306*	-0.17196	0.18361	0.28235*	0.1849*
10	KFH	-0.47276*	0.10346	0.12101	0.12266	0.05269	0.286*
11	KINVST	-0.34065*	-0.32201*	0.39463*	-0.17418	0.11309	-0.1396
12	KMB	0.01998	0.02675	0.21752	-0.07813	-0.11044	0.00806
13	KREST	0.06763	0.11167	-0.15748	0.22760*	0.21729*	0.11105
14	KRESTB	0.08287	0.21366*	0.07833	0.03517	0.00775	0.19368
15	MTELE	-0.29346*	-0.06076	0.08701	-0.00283	0.13863	0.07736
16	NBK	-0.22950*	0.13553	0.10859	0.04895	0.09332	-0.0043
17	NREST	-0.08196	-0.02272	-0.08011	-0.33027	0.00125	-0.0471
18	PHARMA	0.24632*	-0.01353	-0.01948	-0.12155	0.03510	-0.0742
19	PWARH	0.02732	0.05187	0.11502	0.10842	-0.02870	-0.0361

Appendix No 6-2(3): Result of Serial Correlation Coefficients lag1, 2, 3, 4,5, 10 For Saudi Daily Data.

OBS	COMPANY _	LAG1	LAG2	LAG3	LAG4	LAG5	LAG10
1	ALQA	0.02407	-0.07850	-0.06222	0.040086	-0.08450	-0.047786
2	BHC	-0.16511*	-0.1286	-0.03750	-0.01115	0.08485	0.17749
3	CENTRAL	-0.28111*	-0.10421	0.08630	-0.05219	-0.11511	-0.17494
4	COMM	0.08852*	-0.04425	-0.01810	0.0550	0.0869	-0.03550
5	ESAG	-0.14421*	0.25938	0.15347	-0.09470	-0.08000	0.04526
6	FISH	-0.09400*	-0.08721	0.13124	-0.06810	-0.06271	-0.06131
7	HAG	-0.10412*	-0.08555	-0.07400	-0.05147	-0.07661	-0.07170
8	MIND	-0.19800*	0.07597	-0.14710	0.05405	-0.05113	-0.14090
9	NADAC	-0.11700*	0.04967	-0.06570	-0.01266	-0.06491	0.02409
10	NGAS	-0.07000*	-0.06633	-0.05300	-0.05410	-0.05250	0.03028
11	NSHIPN	-0.35631*	0.35148	-0.36880	0.36041	-0.25294	-0.38960
12	PHARM	-0.09860*	-0.01815	-0.03256	0.03067	-0.02462	-0.09653
13	SABIC	-0.27032*	0.19739	0.35210	-0.50472	0.52418	0.13978
14	SAFCO	-0.12490*	-0.07004	-0.13140	-0.02813	0.01715	0.03130
15	SAUTO	-0.01577	0.13629	-0.09100	-0.08360	-0.08520	0.02925
16	SBB	-0.20611*	-0.16677	-0.15400	-0.15430	-0.16660	-0.15110
17	SCB	-0.14122*	-0.13314	0.18510	-0.12840	-0.11690	-0.12270
18	SCEMNT	0.02162	-0.01422	-0.01450	-0.0407	-0.01471	-0.08395
19	SHOT	-0.14971*	0.21780	-0.10400	-0.09700	-0.10420	0.09799
20	SKC	-0.20682*	-0.14011	-0.14800	-0.13500	-0.13920	0.03919
21	SLIV	-0.02793	-0.03777	0.04905	-0.08600	-0.09989	0.07992
22	TAG	-0.12160*	-0.13783	-0.08900	0.11168	-0.08200	0.11497
23	TRANSP	-0.02151	-0.03373	-0.08900	-0.08400	-0.08430	-0.01536
24	WEST	-0.08211*	-0.02555	-0.04025	-0.16001	-0.05833	-0.01550
25	YANBU	-0.16270*	-0.12888	-0.12800	-0.13000	-0.12080	0.12154

* Significant at 5% level.

Appendix No 6-2(4): Result of Serial Correlation Coefficients lag1, 2, 3, 4,5, 10 For Saudi Weekly Data.

OBS	COMPANY _	LAG1	LAG2	LAG3	LAG4	LAG5	LAG10
1	ALQA	-0.58138*	0.12124	-0.08677	0.04928	0.01188	0.07975
2	BHC	-0.53048*	-0.02457	0.12320	-0.12156	0.06132	0.21437
3	CENTRAL	-0.38801*	0.20759	-0.08075	-0.10904	-0.00298	-0.17390
4	COMM	-0.40695*	-0.10867	-0.07788	-0.07075	-0.10602	-0.00985
5	ESAG	-0.53672*	0.01761	-0.06537	-0.01746	0.10487	-0.15659
6	FISH	-0.57158*	-0.11482	-0.01577	-0.00520	0.03389	0.01228
7	HAG	-0.19200*	-0.26947	-0.05807	0.04134	-0.02593	-0.01501
8	MIND	-0.56657*	-0.13059	0.04052	0.11127	-0.06857	-0.04374
9	NADAC	0.11430*	-0.20109	0.15162	0.01954	-0.17833	-0.00848
10	NGAS	-0.00965	-0.00944	0.01596	-0.01913	-0.08772	-0.10090
11	NSHIPN	-0.50033*	0.06922	-0.01328	-0.15652	0.18949	-0.11717
12	PHARM	-0.48651*	-0.05286	-0.00171	0.09384	0.07327	-0.17685
13	SABIC	-0.48581*	0.03936	0.00579	-0.09376	-0.01721	-0.00937
14	SAFCO	-0.22340*	-0.00511	-0.00348	0.05443	0.08838	-0.14506
15	SAUTO	-0.49336*	0.05482	-0.12759	0.02378	0.20967	-0.03366
16	SBB	-0.01646	0.04475	-0.08514	0.15521	0.01991	0.31645
17	SCB	-0.35462*	0.17263	0.05007	0.03319	-0.01294	0.03773
18	SCEMNT	-0.49697*	0.03333	-0.13245	-0.04961	-0.11256	0.29473
19	SHOT	0.04479*	-0.15210	-0.08329	0.04751	-0.00742	-0.16598
20	SKC	-0.56749*	0.08424	0.00106	0.15649	0.02631	-0.08864
21	SLIV	-0.46287*	-0.11008	-0.00307	0.02408	0.00139	0.03669
22	TAG	-0.31583*	-0.07569	0.12483	-0.18367	0.14852	0.04237
23	TRANSP	-0.06773	0.00171	-0.00937	-0.04277	0.01953	0.04237
24	WEST	-0.58409*	-0.02340	0.12345	0.09001	-0.13059	0.18523
25	YANBU	-0.17573*	0.06206	-0.22270	0.28403	-0.12191	-0.05964

* Significant at 5% level

Appendix No. 6-2(5): Result of serial correlation Coefficients lag1 , 2, 3, 4, 5, 10 for Bahrain Daily Data

OBS	COMPANY _	LAG1	LAG2	LAG3	LAG4	LAG5	LAG10
1	ABC	-0.23394*	0.02277	0.10953	-0.048572	0.02408	-0.01862
2	ACB	-0.09521	0.02472	0.06825	0.015426	0.00402	-0.12440*
3	BBK	0.06286	-0.06300	-0.02021	-0.079908	0.08397	0.00449
4	BIB	-0.38207*	0.01470	0.02587	0.041035	-0.04918	0.03199
5	BISB	-0.37614*	0.04318	0.10874	-0.086327	0.06867	-0.09277
6	BSB	0.10409	0.18133*	-0.08966	-0.019929	-0.07363	0.04450
7	BTC	-0.17507*	0.05779	-0.03094	-0.029216	-0.01639	-0.08681
8	BTOUR	-0.11487	0.00405	0.01688	0.046110	0.00386	-0.07981
9	INV	-0.35916*	-0.01329	-0.01067	0.014157	0.16634	0.10223
10	NBB	-0.19858*	0.01963	0.00809	0.003909	0.00548	-0.01356
11	NIEC	0.17850*	0.14259*	0.05830	0.046988	-0.04568	-0.08921

*Significant at 5% level

Appendix No. 6-2(6): Result of serial correlation Coefficients lag1 , 2, 3, 4, 5, 10 Bahrain Weekly Data

OBS	COMPANY _	LAG1	LAG2	LAG3	LAG4	LAG5	LAG10
1	ABC	-0.29547*	0.50413*	-0.01098	0.31624*	0.08643	-0.15032
2	ACB	0.05409	0.02144	0.14504	0.34556*	0.07165	-0.23723*
3	BBK	0.01223	-0.09705	0.02120	-0.24227*	0.47901*	-0.01011
4	BIB	-0.22761*	-0.01732	0.02547	0.05537	0.02242	0.07651
5	BISB	0.12491	-0.05850	0.18051	-0.01358	0.07683	-0.22322*
6	BSB	0.38641*	0.13504	-0.04766	0.04069	-0.10679*	0.28907*
7	BTC	-0.15147	-0.09646	0.35929*	-0.21685*	0.10192	-0.04105
8	BTOUR	-0.19646	0.05948	0.05885	-0.23659	0.25894	-0.25151
9	INV	-0.41204*	0.19081	-0.15594	-0.08013	0.21103	0.25888*
10	NBB	-0.02268	0.11667	0.04738	0.08191	0.04844	-0.01623
11	NIEC	0.33011*	0.05794	0.04428	0.13339	0.18783	0.00516

* Significant at 5% level

Appendix No. 6-2(7): Result of serial correlation Coefficients lag1 , 2, 3, 4, 5, 10 Oman Daily Data

OBS	COMPANY _	LAG1	LAG2	LAG3	LAG4	LAG5	LAG10
1	dct	0.00847	-0.03555	-0.00518	-0.007500	0.05511	-0.070907
2	didi	-0.09587	-0.03492	0.01426	0.021104	0.03128	0.002812
3	fish	-0.07095	-0.04232	-0.06886	0.036268	0.00935	-0.021159
4	mmci	-0.08009	0.04883	0.06472	-0.039499	0.01981	0.090866
5	ngas	-0.07089	-0.00338	0.12657	-0.061434	0.03094	0.025092
6	oas	0.12822	0.05010	0.10572	-0.006204	0.03374	-0.054297
7	ofm	0.00107	0.08894	0.06201	0.066165	-0.01656	0.000623
8	oidi	-0.11140	-0.00323	0.14561	-0.099967	-0.01634	0.055616
9	oif	0.08833	0.01392	-0.00437	0.010962	-0.03416	-0.011827
10	onins	-0.14949	-0.03174	0.04213	0.032970	0.08289	0.055005
11	or	-0.07761	0.13153	0.00795	0.097595	-0.13172	0.014950
12	psc	0.05875	0.10659	0.02501	-0.087938	0.00918	-0.013644
13	raysut	-0.00819	0.08675	0.07160	-0.013141	-0.03934	0.032630

* Significant at 5% level

Appendix No. 6-2(8): Result of serial correlation Coefficients lag1 , 2, 3, 4, 5, 10 Oman Weekly Data

OBS	COMPANY	LAG1	LAG2	LAG3	LAG4	LAG5	LAG10
1	dct	0.09282	0.10847	-0.02318	-0.03466	0.00136	-0.09145
2	didi	0.14165	-0.03472	0.02433	-0.02307	0.00809	0.08393
3	fish	-0.46379	0.06943	-0.05269	0.24459	-0.16799	-0.12705
4	mmci	-0.37193	-0.12923	-0.14942	0.01000	0.05699	0.24394
5	ngas	0.24102	-0.33142	0.45172	-0.11427	-0.10271	0.22152
6	oas	0.05882	0.11590	0.24041	-0.03323	0.05702	-0.06834
7	ofm	0.13285	0.08459	0.09454	0.01970	-0.10512	-0.11230
8	oidi	0.04229	-0.31238	0.21824	-0.07841	-0.00639	-0.07742
9	oif	0.10783	0.10567	-0.14034	0.34116	0.03014	-0.03515
10	onins	0.02641	-0.03763	0.24069	0.06663	0.08080	0.09525
11	or	-0.56649	0.53672	0.02633	0.28688	-0.09598	-0.23261
12	psc	0.12954	0.11214	0.19807	-0.31239	0.08084	-0.01458
13	raysut	0.13426	0.11005	-0.20977	-0.00721	0.03722	-0.01550

* Significant at 5% level

Appendix No.6-3(1): Runs Test Result of Kuwait Daily Price Changes.

OBS	COMPANY	RUNS	RE	SRE	K
1	AB	494	429.866	12.1992	5.29826*
2	ARI	323	314.537	10.2019	0.87854
3	BB	547	511.943	13.0629	2.72203*
4	CBK	583	535.538	13.3828	3.58388*
5	CFC	257	230.679	8.8664	3.02499*
6	CI	440	403.421	11.6131	3.19284*
7	GB	587	539.149	13.4289	3.60049*
8	GLFC	236	234.685	8.8032	0.20623
9	IINVST	262	205.022	8.9663	6.41042*
10	KFH	592	551.596	13.5757	3.01300*
11	KINVST	234	189.121	8.8755	5.11281*
12	KMB	309	269.204	9.6311	4.18400*
13	KREST	351	322.617	10.4556	2.76240*
14	KRESTB	304	267.289	9.6059	3.87375*
15	MTELE	529	516.494	13.1877	0.98619
16	NBK	607	568.581	13.7520	2.83009*
17	NREST	187	158.712	7.7174	3.73025*
18	PHARMA	260	209.679	9.3074	5.46027*
19	PWARH	379	337.775	10.9971	3.79414*

Runs: is the actual number of runs
RE: is the expected number of runs
SRE: Standard Error
K: is the standard variable
* K is greator than twice its computed standard error.

Appendix No. 6-3(2): Runs Test Rsult of Kuwait Weekly Price Changes.

OBS	COMPANY	RUNS	RE	SRE	K
1	AB	117	97.064	5.72289	3.57090*
2	ARI	66	71.692	4.81236	-1.28660
3	BB	114	108.222	5.94456	1.05605
4	CBK	122	113.849	6.11058	1.41577
5	CFC	60	49.775	4.02087	2.66733*
6	CI	97	90.944	5.53388	1.18469
7	GB	115	117.682	6.20338	-0.51292
8	GLFC	60	56.714	4.25572	0.88956
9	IINVST	56	45.973	3.96444	2.65536*
10	KFH	133	119.480	6.25180	2.24248*
11	KINVST	48	41.435	3.85315	1.83362
12	KMB	66	56.146	4.34430	2.38334*
13	KREST	84	71.637	4.90486	2.62247*
14	KRESTB	70	62.060	4.62110	1.82640
15	MTELE	126	110.141	6.02987	2.71296*
16	NBK	133	116.729	6.19166	2.70867*
17	NREST	41	28.882	3.31489	3.80635*
18	PHARMA	58	47.548	4.33949	2.52388*
19	PWARH	101	75.651	5.22156	4.95047*

Runs: is the actual number of runs
RE: is the expected number of runs
SRE:Standard Error K is the standard variable

Appendix No. 6-3(3): Runs Tests of the Saudi Daily Data.

1	ALQA	762	628.862	15.1486	8.8218*
2	BHC	774	686.479	15.2369	5.7768*
3	CENTRAL	715	675.071	14.9828	2.6984*
4	COMM	797	598.143	15.8142	12.6062*
5	ESAG	663	674.095	14.9641	-0.7749
6	FISH	695	704.143	15.2949	-0.6305
7	HAG	785	674.629	15.2236	7.2828*
8	MIND	818	639.049	15.5167	11.5650*
9	NADAC	785	608.895	15.6074	11.3155*
10	NGAS	685	699.701	15.2421	-0.9973
11	NSHIPN	768	665.137	15.0620	6.8625*
12	PHARM	1803	617.465	15.6157	11.9133*
13	SABIC	1813	591.603	16.1731	13.7201*
14	SAFCO	1660	697.531	15.2181	-2.4991*
15	SAUTO	679	616.936	14.6988	4.2564*
16	SBB	1747	713.971	15.4467	2.1707*
17	SCB	1561	671.357	14.7818	-7.4996*
18	SCEMNT	1613	684.381	15.0384	-4.7798*
19	SHOT	1731	708.516	15.3539	1.4970
20	SKC	1784	673.443	15.2831	7.2667*
21	SLIV	1768	640.402	15.2164	8.4184*
22	TAG	1760	640.547	15.4013	7.7885*
23	TRANSP	1817	668.065	15.3982	9.7047*
24	WEST	1715	714.500	15.4073	0.0649
25	YANBU	1698	694.194	15.1862	0.2835

Appendix No. 6-3(4): Runs Tests of the Saudi Weekly Data.

OBS	COMPANY	RUNS	RE	SRE	K
1	ALQA	86	65.6935	5.40326	3.85072*
2	BHC	79	59.7636	5.05179	3.90680*
3	CENTRAL	68	49.5227	4.44580	4.26858*
4	COMM	104	79.6835	6.23960	3.97725*
5	ESAG	63	48.2184	4.45563	3.42973*
6	FISH	58	45.4828	4.58348	2.84003*
7	HAG	73	56.6182	5.13743	3.28604*
8	MIND	96	75.2411	5.75691	3.69275*
9	NADAC	102	81.8333	6.10587	3.38472*
10	NGAS	57	41.6098	4.45629	3.56580*
11	NSHIPN	80	58.7037	4.99721	4.36169*
12	PHARM	98	74.9028	5.89415	4.00350*
13	SABIC	100	85.4364	6.32559	2.38138*
14	SAFCO	52	39.9744	4.38419	2.85700*
15	SAUTO	79	62.4118	5.34022	3.19991*
16	SBB	81	58.8772	5.25812	4.30245*
17	SCB	46	34.8824	4.07785	2.84897*
18	SCEMNT	56	40.9231	4.32462	3.60191*
19	SHOT	69	52.4681	4.59955	3.70295*
20	SKC	85	64.5484	5.42291	3.86354*
21	SLIV	88	69.8955	5.67806	3.27656*
22	TAG	103	74.4759	5.95746	4.87190*
23	TRANSP	91	69.4889	5.74504	3.83133*
24	WEST	63	48.9130	4.66898	3.12422*
25	YANBU	50	40.3600	4.18661	2.42201*

Appendix No. 6-3(5): Runs Test Results for Bahrain Daily Data

OBS	COMPANY	RUNS	RE	SRE	K
1	ABC	222	233.705	8.7781	-1.39034
2	ACB	319	256.936	9.7457	6.41964*
3	BBK	317	281.129	10.1328	3.58943*
4	BIB	274	212.497	9.3161	6.65545*
5	BISB	150	112.882	6.7453	5.57695*
6	BSB	169	136.187	7.4376	4.47895*
7	BTC	366	1284.110	10.4217	7.90563*
8	BTOUR	187	158.871	7.8809	3.63269*
9	INV	291	206.398	9.1644	9.28617*
10	NBB	237	191.018	8.4979	5.46986*
11	NIEC	298	248.270	9.6878	5.18492*

Appendix No. 6-3(6): Runs Test Results for Bahrain Weekly Data

OBS	COMPANY	RUNS	RE	SRE	K
1	ABC	44	48.8889	3.93872	-1.36818
2	ACB	58	45.9383	4.24437	2.95962*
3	BBK	59	56.3191	4.49789	0.70719
4	BIB	58	43.3250	4.23985	3.57914*
5	BISB	30	23.4324	2.75895	2.56169*
6	BSB	36	26.4902	3.53344	2.83288*
7	BTC	65	56.2000	4.54458	2.04640*
8	BTOUR	31	28.7200	3.32571	0.83591
9	INV	58	41.7632	4.17272	4.01101*
10	NBB	35	32.5357	3.49982	0.84698
11	NIEC	58	48.0353	4.36563	2.39707*

Appendix No. 6-3(7): Runs Test Results for Oman Daily Data

OBS	COMPANY	RUNS	RE	SRE	K
1	ABC	222	233.705	8.7781	-1.39034
2	ACB	319	256.936	9.7457	6.41964*
3	BBK	317	281.129	10.1328	3.58943*
4	BIB	274	212.497	9.3161	6.65545*
5	BISB	150	112.882	6.7453	5.57695*
6	BSB	169	136.187	7.4376	4.47895*
7	BTC	366 1	284.110	10.4217	7.90563*
8	BTOUR	187	158.871	7.8809	3.63269*
9	INV	291	206.398	9.1644	9.28617*
10	NBB	237	191.018	8.4979	5.46986*
11	NIEC	298	248.270	9.6878	5.18492*

Appendix No. 6-3(8): Runs Test Results for Oman Weekly Data

OBS	COMPANY	RUNS	RE	SRE	K
1	ABC	44	48.8889	3.93872	-1.36818
2	ACB	58	45.9383	4.24437	2.95962*
3	BBK	59	56.3191	4.49789	0.70719
4	BIB	58	43.3250	4.23985	3.57914*
5	BISB	30	23.4324	2.75895	2.56169*
6	BSB	36	26.4902	3.53344	2.83288*
7	BTC	65	56.2000	4.54458	2.04640*
8	BTOUR	31	28.7200	3.32571	0.83591
9	INV	58	41.7632	4.17272	4.01101*
10	NBB	35	32.5357	3.49982	0.84698
11	NIEC	58	48.0353	4.36563	2.39707*

Appendix No.7-1 : The Spread Estimate of Kuwait Market

Company	Daily	Weekly
AB	1.5844242	2.6038433
ARI	1.4502414	1.7753873
BB	1.1299558	1.2489996
CBK	1.2494799	1.3221195
CFC	2.6707302	3.6133087
CI	1.0501428	0.5291503
GB	2.0937049	1.7146428
GLFC	2.200818	2.2036334
IINVST	1.026645	-3.717526
KFH	1.8642961	3.4397674
KINVST	5.3667867	7.2
KMB	0.9757049	-0.812404
KREST	1.3446189	-1.30384
KRESTB	0.4326662	-1.675709
MTELE	1.1140916	1.8558017
NBK	1.0205881	1.8449932
NREST	2.0651392	1.5773395
Phara	2.6734996	-4.894487
PWARH	-2.050073	-0.619677
Average	1.54	.97

Appendix No. 7-2: Saudi Arabia Spread for Daily and Weekly Data

Company	Daily Spread	Weekly Spread
ALQA	6.4594117	9.51356936
BHC	5.4416909	5.2653603
Central	2.7085051	8.8065884
COMM	6.2379484	3.9506961
ESAG	6.2222183	6.8512773
FISH	2.6427259	12.031293
HAG	3.8522721	7.239337
MIND	7.5440042	4.032865
NADAC	4.5126489	7.9779697
NGAS	2.826305	5.2790151
NSHIPN	7.7242475	8.0954308
PHARM	5.7407317	9.2772841
SABIC	3.9572718	7.3664103
SAFCO	2.5721586	4.8232769
SAUTO	7.7169942	6.5912063
SBB	5.6206761	10.493045
SCB	3.4327831	8.2236245
SCEMNT	3.2130982	8.8215645
SHOT	5.7466512	8.5381497
SKC	7.3807859	5.6713314
SLIV	8.5486841	11.531695
TAG	4.5895534	9.0175385
TRANSP	9.4813501	6.5574385
WEST	2.1494185	6.4853681

YANBU	5.3118735	6.0850637
Average	5.2653603	7.7580862

Appendix No. 7-3: Spread Estimate for Bahrain Market

Company	Daily Spread	Weekly Spread
ABC	1.9445308	2.0825945
ACB	2.0387251	-1.47973
BBK	-1.732628	-0.690507
BIB	4.7835552	3.6482324
BISB	5.3588805	-2.204631
BSB	-1.775613	-4.360963
BTC	1.7315889	1.5605127
BTOUR	2.0318465	2.0292856
INV	.6887098	5.3299531
NBB	.0895579	1.3249906
NIEC	1.465742	-2.284032
AVERAGE	2.0630374	0.4505187

Appendix No.7-4: The Spraed Estimate for Oman Market

Company	Daily	Monthly
DCT	-0.306594	-0.91214
DIDI	1.1516944	-1.155855
FISH	0.972214	2.3250806
MMCI	1.81637	3.5874225
NGAS	1.1431535	-1.776964
OAS	-1.663731	-1.209959
OFM	-0.121655	-1.400286
OIDID	1.223	-0.6896382743
OIF	-1.03769	-1.384197
ONINS	1.429	-0.6016644055
OR	2.1427086	4.8776224
ONINS	-1.01	-1.4298257644
RAYSAT	0.317	-1.0394234902T
Average	.47	-.06

Appendix No. 7-5: The Effective Bid-Ask Spread of Kuwait Companies (Modified Method)

Company	Daily	Weekly	Monthly
AB	0.00560	0.005607	0.005607
ARI	0.00585	0.005855	0.005855
BB	0.00673	0.006731	0.006731
CBK	0.00610	0.006104	0.006104
CFC	0.00716	0.007162	0.007162
CI	0.01088	0.010882	0.010882
GB	0.00552	0.005525	0.005525
GLFC	0.00362	0.003624	0.003624
IINV	0.02343	0.023430ST	0.023430
KFH	0.00559	0.005597	0.005597
KINV	0.02202	0.022027ST	0.022027
KMB	0.00771	0.007718	0.007718
KRES	0.01121	0.011217T	0.011217
KRES	0.00978	0.009786TB	0.009786
MTEL	0.00524	0.005240E	0.005240
NBK	0.00453	0.004539	0.004539
NRES	0.01365	0.013650T	0.013650
PHAR	0.01633	0.016331MA	0.016331
PWAR	0.00921	0.009216H	0.009216

Table No. 7-6: The effective Bid-Ask Spread Estimate of Saudi Companies (Modified Method)

Company	Daily	Weekly	Monthly
ALQA	0.008459	0.027602	0.013019
BHC	0.006124	0.028925	0.012019
CENTRAL	0.003478	0.019815	0.010322
COMM	0.010897	0.028939	0.012704
ESAG	0.009262	0.045029	0.035940
FISH	0.007326	0.028417	0.012849
HAG	0.003351	0.018391	0.019597
MIND	0.011620	0.024978	0.018417
NADAC	0.003606	0.019379	0.021455
NGAS	0.003637	0.027309	0.010647
NSHIPN	0.010787	0.031253	0.021777
PHARM	0.010451	0.031017	0.014470
SABIC	0.013685	0.014440	0.012244
SAFCO	0.010393	0.027350	0.012404
SAUTO	0.007441	0.042401	0.024662
SBB	0.009332	0.022669	0.042085
SCB	0.013351	0.029512	0.013229
SCEMNT	0.010594	0.028462	0.011653
SHOT	0.005733	0.039963	0.019761
SKC	0.006546	0.026581	0.027765
SLIV	0.012532	0.025111	0.025541
TAG	0.004392	0.023756	0.011930
TRANSP	0.030188	0.031851	0.011470

Table No. 7-6: The effective Bid-Ask Spread Estimate of Saudi Companies (Modified Method)

Company	Daily	Weekly	Monthly
ALQA	0.008459	0.027602	0.013019
BHC	0.006124	0.028925	0.012019
CENTRAL	0.003478	0.019815	0.010322
COMM	0.010897	0.028939	0.012704
ESAG	0.009262	0.045029	0.035940
FISH	0.007326	0.028417	0.012849
HAG	0.003351	0.018391	0.019597
MIND	0.011620	0.024978	0.018417
NADAC	0.003606	0.019379	0.021455
NGAS	0.003637	0.027309	0.010647
NSHIPN	0.010787	0.031253	0.021777
PHARM	0.010451	0.031017	0.014470
SABIC	0.013685	0.014440	0.012244
SAFCO	0.010393	0.027350	0.012404
SAUTO	0.007441	0.042401	0.024662
SBB	0.009332	0.022669	0.042085
SCB	0.013351	0.029512	0.013229
SCEMNT	0.010594	0.028462	0.011653
SHOT	0.005733	0.039963	0.019781
SKC	0.006546	0.026581	0.027785
SLIV	0.012532	0.025111	0.025541
TAG	0.004392	0.023758	0.011930
TRANSP	0.030188	0.031851	0.011470

WEST	0.004017	0.014387	0.012659
YANBU	0.008264	0.029064	0.0

Appendix No. 7-7: The Effective Bid-Ask Spread of Bahrain Companies (Modified Method)

COMPANY	Daily	Weekly	Monthly
ABC	0.004269	0.006161	0.008940
ACB	0.010823	0.014937	0.008981
BBK	0.010747	0.013955	0.007655
BIB	0.007425	0.018567	0.017679
BISB	0.011172	0.012375	0.013498
BSB	0.008411	0.023250	0.007786
BTC	0.006746	0.004704	0.009009
BTOUR	0.010384	0.018839	0.012941
INV	0.010970	0.012643	0.012219
NBB	0.011580	0.031990	0.019640
NIEC	0.004534	0.007417	0.003647

Appendix No. 7-8: The Effective Bid-Ask Spread of Oman Companies (Modified Method)

COMPANY	Daily	Weekly	Monthly
DCT	0.004222	0.005433	0.009761
DIDI	0.003905	0.006405	0.008942
FISH	0.004695	0.005302	0.007543
MMCI	0.011307	0.012873	0.007305
NGAS	0.007040	0.010491	0.003987
OAS	0.006376	0.012329	0.005261
OFM	0.005449	0.008028	0.004480
OIDI	0.006331	0.006381	0.016495
OIF	0.006556	0.009219	0.011981
ONINS	0.006694	0.003877	0.003328
OR	0.012074	0.010385	0.006839
PSC	0.006464	0.007174	0.004064
RAYSUT	0.006208	0.005011	0.005445